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On the Wings of To-day

An Account of the First International Aviation Meet in America, at Los Angeles, California

By CHARLES K. FIELD

ILLUSTRATED WITH PHOTOGRAPHS BY H. C. TIBBITTS

World's Records made at Los Angeles

1. ***Height—Louis Paulhan (former world's record, 3200 feet) 4165 feet***
2. ***Quick Start—Glenn Curtiss (former world's record, 8 seconds) 6⅖ seconds***
3. ***Short Start—Glenn Curtiss (former world's record, 115 feet) 98 feet***
4. ***Accuracy—Charles F. Willard; rising from a square of twenty feet on an edge, he made a complete circle and brought his machine to a full stop on the same square***
5. ***Cross-Country with passenger—Paulhan and Mme. Paulhan, 21¼ miles***
6. ***Cross-Country alone—Paulhan, 45.1 miles in 1 hr., 2 min., 42⅘ sec.***

HAVE you ever dodged an air-ship? It is a very different matter from dodging the usual motor-car. Most of us have become fairly expert at that—it is only a matter of a jump to one side or the other of a street to which the automobile is confined. There is nothing of this definiteness about an air-ship. The aeroplane has all space in which to swerve as sharply as a hawk while it literally bears down upon you. There is only one way to dodge it—lie down flat upon the ground. If the air-ship does not alight at that particular spot, you have dodged it.

One fact will work in your favor—it will be much more serious for the aviator than for you if he should hit you. This is another difference, considering automobiles. Yet, to one who crossed the aviation field at Dominguez during the aviation meet at Los Angeles, the latter part of January, getting hurriedly out of the way of the bewildering air-craft that came humming at his head, it seemed that if this form of travel is to become general some system of refuge, some underground safety station must be invented for the harrassed pedestrian—assuming that the pedestrian is not a species on the way to extinction. Was it not natural to attach significance to the purchase of an aeroplane on the field by a man from Kansas? The cyclone-cellar, already in use, offers an excellent beginning for the necessary utility.

Rough Riders of yesterday and to-day. A Mexican deputy sheriff in the trappings of early California, and Miscarol, the French aviateur, grooming his Bleriot monoplane

Los Angeles had gone air-ship mad. The hotel lobbies were peopled with visitors, each of whom had some sort of air-craft at home, unpatented and guarded as the solution of the whole problem. Overheard conversations held such terms as monoplane, heliocopter, ornithopter, aeronef, almost as frequent as the word dollars. Even the big Charity Ball at the Hotel Maryland, Pasadena, was an Aviation Ball, with Paulhan, the King of the Air, always moving in the upper circles, leader of the grand march. Statements in the press of the possibilities of lofty aerial flight had drawn the eyes of the town from its thronged pavements to the smiling skies above them. One evening, about sundown, everyone on the streets had tipped his chin toward the horizon and sent his eyes searching through the sky for whatever it was that had caused his neighbor to do likewise. Successful searchers pointed out their find to slower eyes. It was a star, faintly shining high in the west and apparently flying at record speed across the sky. The effect of motion was lent by a speeding film of vapor that moved in a contrary direction. In the fever that had struck the town, it was easy to believe that what appeared to be a star was in reality the aviator from France—Paulhan, the incomparable—taking his place temporarily among the constellations.

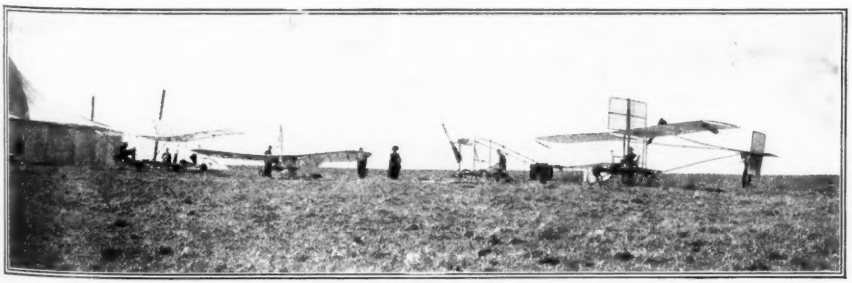
"*Have you seen Trixie?*" The question came large from a megaphone at the crowded gates of the field. We had not seen her, and if she were lost in that surging mass of people, so much the worse for Trixie. "The fattest girl in the world," explained the megaphone. Joined to the newest wonder, the flying men, were the oldest of the world's wonders, housed in hasty tents along the great white way to the grandstand—Fatima, the Sultan's Delight—"Just arrived, a mother rattlesnake and five little ones." The Secrets of the Egyptian Pyramids ("tell me your birthday and I'll tell you your horrorscope"), and Cora-Etta, a version of the Siamese Twins, and now, in the light of present-day marvels, fitly termed the Human Biplane. In the line with these motley attractions, so singularly unnecessary and unrelated to the interest that had drawn the eager people to Dominguez, stretched countless lunch-counters with a varied appeal, and none of it very strong. Behind it lay a deep swale which we called Grub Gulch, its nearer slope covered with lunch débris, offering excellent forage for birds that did not feed on gasoline.

At the end of this gauntlet stood the grandstand, with fourteen sections that held each about a thousand closely-seated people. On the slightly sloping floor below those seats were the boxes, sold for the entire ten days of the meet, and at a point in front of these, the boxes for the newspaper people. Location of seats mattered little for events scheduled for the air. A wire fence

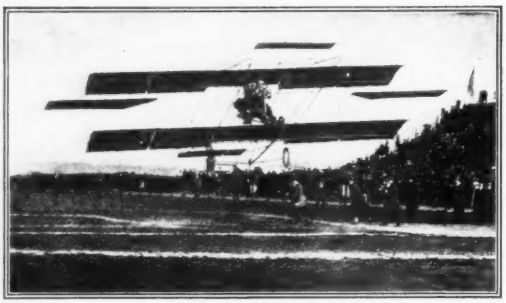
ran along in front of the spectators' seats and stretched away down the gently sloping field and around the mile-and-a-half course, guarded by deputy sheriffs, some of whom were elaborate with riatas and mountings of silver and carved leather, descended from "the splendid idle forties."

For at least a quarter of the distance the fence was lined with people, six and more deep. They were a patient lot, these audiences, for there are long waits between the acts at an aviation meet—the god of the gas machine demands assiduous worship and this the people seemed to have learned. But, indeed, the landscape that lay before them might well have held them. From the spectators' vantage-ground an open prairie, spread with the soft green of California's January, sloped very gently toward the distant city. Half-way across it were three large circus-tents, respectively the headquarters of Glenn H. Curtiss, with Hamilton and Willard; Paulhan, with Miscarol and Masson and Renan; and the local aviators with their varied engines of the air. It was of these last that some wag said: "The local aviators were early on the ground —and never left it." Back of the tents the field sloped sharply toward broad, newly-plowed fields; then to east and north spread a panorama of blended orchards and bungalow roofs and eucalyptus groves, beyond these the pinkish-red mass of the city, and behind all, the violet wall of the Sierra Madre, with Baldy lifting his snowy shoulders above it. The soft air of a spring day wrapped the beautiful expanse of country. On the way to the field the cars had passed through bungalow villages whose streets, lined with fruit trees, told the story of an orchard's metamorphosis. On the porches of these bungalows sunbonneted women sat sewing in the January sun. Under a great bare willow in one yard some children played on an enormous red plush sofa. The grandstand at the field was gay with Japanese parasols. It was the magical preliminary spring of California, a season that seems sufficiently unreal to produce such a marvel as men who fly with wings. Toward the end of the day, when all breeze died away and the best flying was done, the great vista lay dreaming in rose and lavender. Perhaps it was a dream of a comparatively recent past when the adventurous but lowly-minded padres toiled along El Camino Real and tried to bring to the slow minds of the Mission Indians some understanding of their promise of a future of winged angels and a rising into heaven.

It has never been authoritatively stated whether Pegasus was kept in a stable or in an aviary. It is equally unsettled as to which of these terms is to be applied to the housing of a flying-machine. Thus the word *hangar* (pronounced quite otherwise as *unger*), is a welcome addition to a vocabulary which was refreshed only yesterday with *garage*. The great worm-like dirigible balloons, fat and brown and pointed at head and tail, were kept down in Grub Gulch—an added reason for the name. These issued forth unexpectedly from behind the grandstand, casting their gigantic shadows on the people as they sailed over the audience and rose and dived with whatever ponderousness may be said to apply to lighter-than-air machines. Knabenshue, sailing over six hundred feet above the field on his slender snowshoe rack under the big yellow bag, the Stars and Stripes flying flat beneath him, was greeted with cheers for his daring. Beachy, less successful, but equally brave, guided his unwieldy craft along the erratic air-currents. But the crowd, though cordial, was not there for balloons. Interest centers in the heavier-



"The local aviators were early on the ground—and never left it"



Glenn Curtiss passing before the grandstand in his biplane

than-air machines. Men have been lifted from the earth by heated air and by gas for many years—the world has been waiting for them to rise on wings.

As though obedient to this call for wings, Prof. Zerbe's multiplane came on the field with many of them—a queer, lumbering affair that looked like a ship under full sail, or a flock of great white geese, or a stand for potted plants, or some fossil vertebrate out of the enormous past, according to one's point of view. There was a noble spurt along the ground, some steam, and then the great creature with a laborious sigh lay over upon its side. The audience laughed—a cruel thumbs-down laugh—careless of the eager thought that had failed to rise from the ground. Men had flown at Rheims—they must not do less at Dominguez.

The tents of the aviators, each holding several of the winged engines, looked like circus-tents in which the characteristic wagons had somehow been stripped to their slender frames. When an engine was tested the tent became a machine-shop and the side-flaps stood out straight in the draught from the whirring propeller. In the Curtiss tent the machines were khaki-colored, as though in anticipation of military service—frames of bamboo and ash, and coverings of rubberized silk. The Farman and Bleriot machines which the Frenchmen operated were grayish-white, taking the sun like silver when in swerving flight; among the other machines there was one of a dawnlike pink—seemingly born to blush unseen.

In the tent of the Frenchmen, apparently deserted, a San Francisco visitor, aflame with the desire for wings, climbed into a Bleriot cross-channel monoplane and sat there imagining the grandstand cheering far below him. This eaglet dream was shattered by a hailstorm of French expletives. A *mecanicien*, his hair and mustaches bristling with rage, fumed beside the machine. With a calm that should some day carry him through aerial difficulties the San Franciscan regarded the irate bird-hostler in astonished hauteur; drawing aside his coat-lapel he exhibited the circular button of the Panama Exposition boosters. The *mecanicien* bowed, said "*Pardon*," and faded away in true European reverence for authority.

Glenn Curtiss is a slender, sober-faced man—a blending of the practical engineer and the young college professor. He appears to have been born deaf and blind to the grandstand. His performance has about as much sensational atmosphere to it as that of a busy man leaving home in his auto for his office. He has an air of quiet authority, of intimate knowledge of his machine, a serious intentness upon the business in hand. He is strictly in the business of selling flying-machines, among other motor vehicles, of which business the winning of the world's speed record is but an incident on advertising account. His demonstration seems to be, not the rivalry of the eagle or the carrier-pigeon—both of whom Paulhan, the Frenchman, has put to shame—but the present-day utility of these novel equipages. And, indeed, as one watches the quiet way in which he takes trips along the air, with or without passengers, one understands why Harmon, the New Yorker, has bought one of these air-canoes, and why to-morrow may see your neighbor practicing over the golf-links with less reason for the family's fear than in the usual auto scorching. The high flying may be reserved for daring spirits until a remote day, but pleasure boating, with a motor to send the craft along the unmapped rivers of the flowing air, is a fact of the here and now.

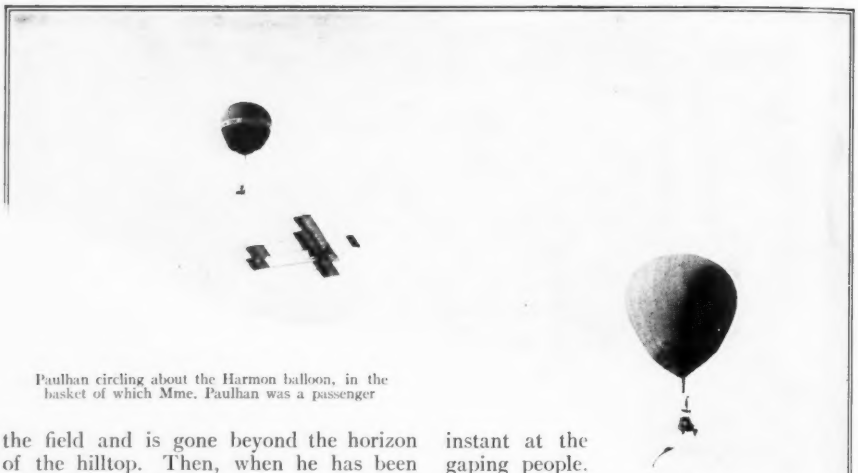
In spite of the bird-lime spread by the Wrights' injunction, the khaki-colored biplane is drawn along on its pneumatic wheels before the grandstand. Curtiss gives a last look over the machine, climbs into the seat between the engine and the steering-wheel, the engine is cranked by its propeller, the men who have been holding the light vehicle against the force of the propeller

until Curtiss gives the signal, release it and a new form of automobile, a flimsy double-kite mounted on a tricycle with an unmuffled gas-engine, is under way across the grass. Thirty thousand eyes are on those rubber-tired wheels, waiting for the miraculous moment—historical for him who has not experienced it. Suddenly something happens to these whirling wheels—they slacken their speed, yet the vehicle advances more rapidly. It is the moment of miracle. The wheels are on the tops of the grass. Then, as though an invisible incline has been spread before him, Curtiss runs up the air along a gentle slope and soon is coursing along a plane a hundred feet above the earth. It has all happened suddenly, yet how much it signifies! It is the moment for which the faith of a world grown used to material conquests has waited, apparently baffled—it is the dream of centuries come true. Instinctively, one draws an awed breath, his mind runs over a list of natural miracles almost within his own memory, he asks himself: "What is there left to conquer?"

Across the field, attenuated by distance to the lines of a gigantic insect, Curtiss is sailing through the air. On he comes, turning the pylons at the corners of the course with a motion less of the bird than of the machine. As he passes the starting line, drawn in sawdust on the black adobe of Dominguez, his hands fast to the wheel, his gaze intent upon the ground, he shuts off his engine, and with a couple of gentle swoops he alights as delicately upon the green as a gull settles upon a bay, and he becomes for a little way an automobile again. This rising in flight and alighting is really a complete demonstration—the birds have been matched for all the needs of argument.

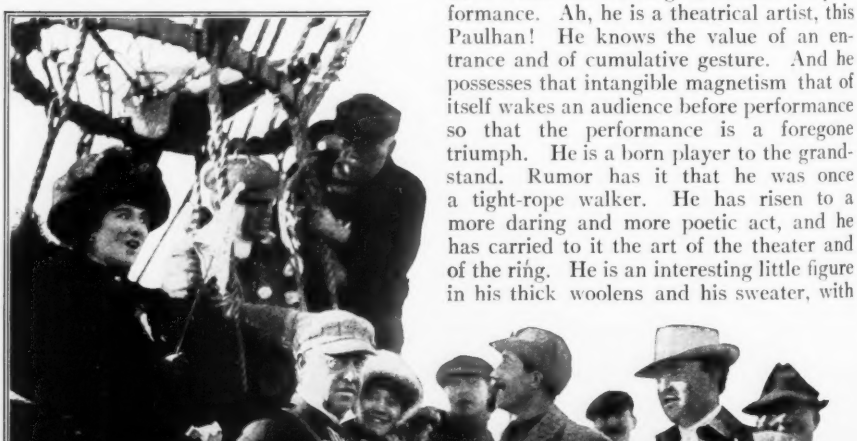
With eyes fixed upon Curtiss at the finish, few have noticed another biplane rising from the far side of the field and following in the American's wake. It is Paulhan, the Frenchman, in a Farman machine, distinguished from the Curtiss biplane by its color and by its single elevating plane in front and its wide box tail. Paulhan flies far up

Louis Paulhan, ready to start in a Farman biplane for one of his spectacular cross-country flights



Paulhan circling about the Harmon balloon, in the basket of which Mme. Paulhan was a passenger

the field and is gone beyond the horizon of the hilltop. Then, when he has been forgotten in other movement upon the field, there comes the humming of an engine far aloft—the sound the sailors heard that memorable dawn off the Dover coast—and seemingly out of a great black cloud that hangs far above the grandstand bursts the flying creature with his parallel wings. When opposite the audience the intrepid little Frenchman waves his hand for an instant at the gaping people. Then on he goes round the course; passing in review again he waves his woolen cap and the crowd responds, cheering with the breath it has just held; round he goes again and, coming the third time, he stops his engine and coasting down the air he raises both arms to the grandstand and alights like a dove while the crowd goes mad at the performance. Ah, he is a theatrical artist, this Paulhan! He knows the value of an entrance and of cumulative gesture. And he possesses that intangible magnetism that of itself wakes an audience before performance so that the performance is a foregone triumph. He is a born player to the grandstand. Rumor has it that he was once a tight-rope walker. He has risen to a more daring and more poetic act, and he has carried to it the art of the theater and of the ring. He is an interesting little figure in his thick woolens and his sweater, with



Countess de Pennendreff — Clifford B. Harmon — Mme. Paulhan — Nat Goodwin — Paulhan — Dick Ferris

Paulhan, having alighted, greets Mme. Paulhan and the rest of the balloon party

heavy-ribbed stockings. He has a face of rose and olive and the smile that won't come off, even in danger. He looks like a debonair Alpine guide, but his are the unseen mountain slopes, the uncharted glaciers of the air.

Thrilling as is Paulhan's flight, the spectator is aware that Willard, in a Curtiss biplane, has performed a marvelous feat when, after rising from a twenty-foot square of sawdust in front of the grandstand, he circles the field and comes to a stop within that starting-square as true as a bird seeks its nest. Hamilton, the third American aviator, flies his Curtiss machine to heights of seven hundred feet and more, and even when his crank-shaft breaks in mid-air, he comes to the ground with the sweep and the precision that marks these airships as cousins to the birds.

Miscarol, attendant and disciple of Paulhan, is a picturesque figure in voluminous overalls and a cap like Bleriot's. He is one of Millet's men with the hoe, turned from a dreary battle with the overworked earth to a glorious struggle with the mysterious air. After several creditable short flights, Miscarol essays to send the Bleriot monoplane skimming like a giant dragon-fly just above the green surface of the field. After flying a little distance the wings waver, they struggle in the air in evident distress, and then, after a desperate bit of bird-busting on the part of the rider, the machine falls like a wounded bird, breaking its left wing.

To the spectators at Dominguez there was far too little of the monoplane. In addition to the romance forever attaching to it because of Bleriot's flight across the English Channel, it is, to the eye, the accomplishment of man's emulation of the birds. Nothing at the Los Angeles meet was more lovely than a flight that Paulhan made toward evening, early in the week. The great valley, spread before the grandstand like a scene in a vast theater, was already bathed in the lavender of evening, but the wall of snow-covered mountains was brilliant with rosy light. Athwart this background flew the wonderful, winged thing of man's invention, so bird-like that man was forgotten in its flight. Turning on the line of the course the wings tipped and were turned by the setting sun into gleaming bronze.

The man-bird had become a tiny cross against the sky

Toward the middle of one afternoon a golden balloon that had been hanging above the valley between the field and Los Angeles, drew nearer and soon came floating gracefully over the field, drawn by a horse. While yet it hung several hundred feet above the field, Paulhan, winged with a Farman biplane, soared into the air and circling the slow-moving newcomer, gave greetings to the party in the basket, which included Mme. Paulhan, chubby, petite and vivacious in an aviation hat that was significant because of the absence of dead birds' wings, and no small factor in the theatrical element that added so keenly to the enjoyment of the Frenchman's performances. The party were the guests of Clifford Harmon, a millionaire "balloonatic" who has also bought a Curtiss biplane in which he made short flights on the aviation field. The balloon came to earth in dignity and out stepped, among others, Nat Goodwin, the actor, solemn as an owl, though his coat-sleeve bore the title "Aviator."

This is not a prehistoric bug; it is a Bleriot cross-channel monoplane

Both Curtiss and Paulhan took the biplane out of the class of solo performances by taking passengers for short flights, and Paulhan thrilled by flying with his pretty wife nestled close to him in those frail wings, a thousand feet above us and miles away cross-country and over the blue Pacific. Such performances cannot be written of lightly—they are the beginnings of a new era in the history of men.

Stirring as were all these flights to those who thought as they watched them, there was one transcendent afternoon in that calendar of thrills. Paulhan rose lightly into the still air of late afternoon. As he climbed above the landscape the megaphone announced that "Mister Lewis Pollen" would try for altitude. Round and round the course the biplane sailed steadily, ever higher in ever widening circles. From instruments by the judges' stand an estimate of altitude was made as the bird-man climbed the sky, and as the figures mounted the excitement of the grandstand climbed with them. Now Paulhan was so high that man and engine had merged into one body beyond which the planes, lighted underneath by the setting sun, stretched like the blood-filled membranes of a bat. Icarus, in Greek legend, flew too near the sun and his wings of wax were melted to his undoing. Paulhan, choosing the sunset hour, had flown above the sun and now climbed fearlessly toward the stars. Presently on the blackboard the world's record was written, three thousand and two hundred feet: the hoarse voice of the megaphone called to the throng of listeners: "two thousand and nine hundred feet, and still going up."

Then the world's record was passed and the instruments and the cameras lost track of the flying man, and still this new wonder of our strenuous life swept higher into the heavens. As the birdlike figure lessened in the sky until it was but a dark cross against the darkening blue, the crowd of fascinated groundlings grew silent. This man who had flown away before our eyes had become a thing apart, a creature utterly lonely, almost a mile above us in a realm where we did not belong. To the memory of many must have come the speech of Bryant to the waterfowl—in the desert and illimitable air above us, one of our own kind, yet different, was lone wandering yet not lost. It was the realization, there in that early dusk of an enchanted winter-day, of Shelley's soaring skylark that "soaring ever singest." There, lonely and cold as he was, that man-bird must irresistibly have sung aloud as he dared the condor's "roads between the thunder and the sun."

Flying home, like a droning beetle, through the dusk

Flying Men-o'-War

By PAUL W. BECK

First Lieutenant U. S. Signal Corps. Special Observer for the War Department at the International Aviation Meet at Los Angeles and one of the Judges of the Contests

"THE latest report from the aerodrome flying squadron sent out from the decks of the Pacific scout-boat flotilla locates the enemy at a point one hundred miles west of San Francisco"; thus might an up-to-date newspaper begin its account of war movements should war now come.

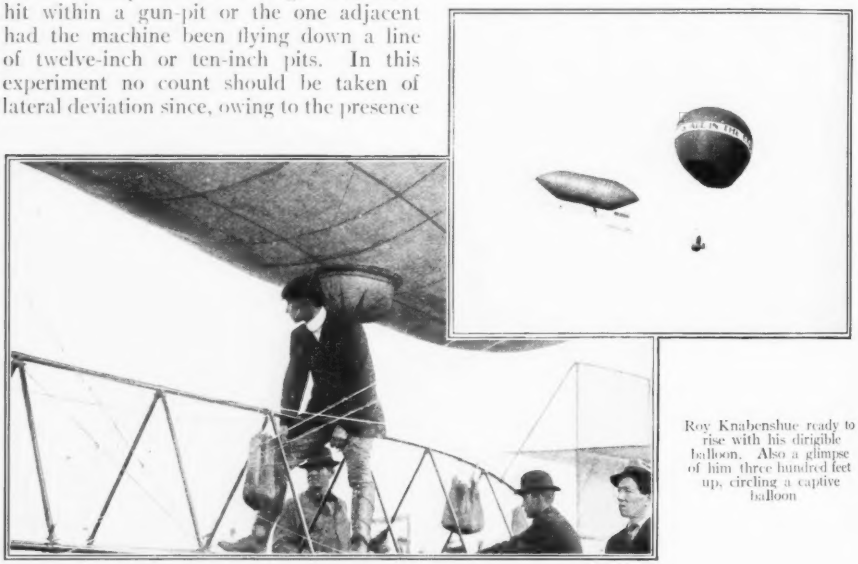
That this is not mere fiction has just been demonstrated at Los Angeles where the speed of flight and short starting of Glenn Curtiss, the height and endurance of Louis Paulhan, and the accuracy of Charles F. Willard bring the matter home in no uncertain manner. Mr. Curtiss, in his Rheims racer, covered sixteen and eleven hundredths miles at the speed of forty-one miles an hour, and rose from the ground after a ninety-eight-foot run; Monsieur Paulhan, driving a Henry Farman biplane, rose to the height of at least four thousand one hundred and sixty-five feet, and remained in the air for two hours—lacking but one and one-half minutes, and Charles F. Willard, in the original Curtiss biplane, rose from a square twenty feet on an edge, sailed through the air for a distance of one and sixty-one hundredths miles, and, alighting, stopped on the same square. The combining of these feats, the partial modification of the deck of a scout-boat, and the United States Navy has acquired a new and important factor in warfare.

Furthermore, both Paulhan and Curtiss carried passengers—the former, two on several occasions. From which the feasibility of transporting high explosives for offensive work is clearly demonstrated. Couple this weight-carrying power with the heights attained by Paulhan, and all fortifications save those protected overhead by covering sufficient to resist the force of a hundred and fifty pounds of high explosive will become untenable. The two principal factors opposed to the offensive success of aerodromes are: The difficulty of accurate direction of objects dropped from such great heights and the accuracy of hostile fire. Both of these factors are largely unknown, but both are readily solvable. It is the duty of the Signal Corps of the Army to compute the tables and work out all other details pertaining to the former, while the Coast Artillery Corps and the Ordnance Department are united in designing weapons whose sole object is to afford means for ridding the sky of these, to them, dangerous pests.

The Signal Corps problem is almost purely mathematical and is based on the law of falling bodies as combined with forward movement. For example, if an aeroplane is equipped with aneroid barometer and recording anemometer, the height and speed may be known with great accuracy at any instant. Knowing these facts, a reference to previously computed tables will show the exact distance from the objective to some spot on the ground over which the aeroplane must be at the instant of releasing the explosive. The principal difficulty

lies in locating this exact spot and in knowing just when the aeroplane is over it. The difficulty of locating the spot obviously increases as the height, while the difficulty of exact release of the projectile increases as the speed.

On Wednesday, January 19, 1910, at Los Angeles, the writer, accompanying Louis Paulhan in his Farman biplane, dropped three small bags containing dirt from a height approximating two hundred and fifty feet, at a speed estimated at forty miles an hour. Any one of these bags would have hit within a gun-pit or the one adjacent had the machine been flying down a line of twelve-inch or ten-inch pits. In this experiment no count should be taken of lateral deviation since, owing to the presence of wires in the machine and the danger of catching in the propeller had the bags been dropped directly in front of the aviator, it was necessary to steer the craft to the right of the target. In actual practice some mechanical means for dropping projectiles straight down from a point beneath the aviator would be devised and the machine would be directed exactly over the target.



Roy Knabenshue ready to rise with his dirigible balloon. Also a glimpse of him three hundred feet up, circling a captive balloon

It is clear that the height from which this experiment was made is insufficient for practical use during daylight as it would present a most vulnerable target for rifle fire. The difficulty of night success lies in the invisibility of the target. However, a multiplication of the number of machines making simultaneous attack would result, even in daylight, in serious embarrassment in the gun-pits. At heights between a thousand and two thousand feet, great accuracy should be readily acquired in dropping projectiles, and the difficulty of hitting an aeroplane at such elevation should be great.

The computation of tables may be greatly simplified and the difficulties of instant drop greatly overcome if angular distances are used instead of linear. This is probably the line along which progress will be made. Unless some now unforeseen obstacle should prevent, we may see the Signal Corps utilizing sextants in conjunction with such tables. For example of this method, suppose a machine to be flying at the rate of forty-five miles an hour at a height of approximately two hundred and fifty feet. From the law of falling bodies an object will drop to the ground from this elevation in about four seconds. In about the same time the machine will move forward about two hundred and fifty feet. The angle of fall will, therefore, be about forty-five degrees. By setting the sextant or slope-board to read forty-five degrees and waiting until the target is in prolongation of the line of sight, the projectile can be dropped with great accuracy.

However futile may be conjectures as to the ultimate outcome of the offensive and defensive measures in relation to aero-

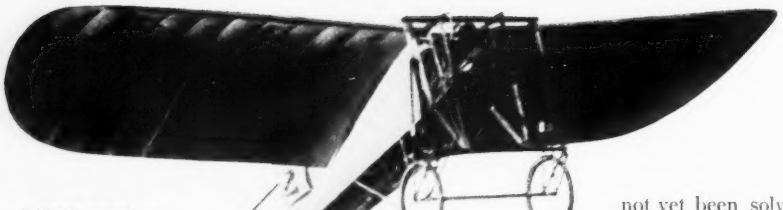
Charles K. Hamilton at the wheel of a Curtiss biplane

dromes, there is one fact patent to all thinking persons: The time has come when the Army and Navy of the United States *must* study the subject thoroughly if the nation is to retain its prestige among the powers of the world. Man's mastery of the air, while not yet absolute, has reached that point where it ceases to be a fad and becomes a solid, persisting fact.

Like all sciences, this one has its nomenclature and classifications. To a correct understanding of the subject it is necessary to prefix at least part of this nomenclature and a general outline of the classifications. In general, all vehicles that fly may be grouped under the name "vehicles of the air." The two primary subdivisions of these vehicles give us: (1) lighter-than-air and (2) heavier-than-air types. Those lighter-than-air may be considered not as a solution but as an evasion of the problem of aerial navigation, yet, from a military standpoint, they have their value, and are worthy, therefore, of notice and comment. More particularly are they valuable for obtaining information of the location of moving bodies of the enemy or of their fortifications, and the general characteristics of the terrane over which operations are being made. Cameras and telephones are used freely in connection with these vehicles, and they have a wide and valuable field of action. Much has already been written and said of the actual and probable value of these aircraft in their relation to warfare, hence it is not the intention of this brief resumé to dwell at length on them. These lighter-than-air (gas or hot-air-lifted) vehicles are either dirigible or non-dirigible. The dirigible types are subdivided into rigid and semi-rigid. The rigid type have internal bracings which keep the gas-bags distended even when not inflated with gas, and, in addition, they are strongly braced to the nacelle or framework on which the engine, propeller and rudders are mounted, and on which the passenger or passengers ride. The

Glenn H. Curtiss, holder of the world's speed record. His passenger is Lieut. Paul W. Beck

Charles F. Willard at the rudder of the biplane in which he made a sensational landing



A Bleriot monoplane in flight

semi-rigid type lacks the internal bracing. Non-dirigibles are either free or captive, the best shapes being approximations of globular. A free balloon becomes captive by being anchored to one spot by a rope, wire or cord. Thus tied and located at a position out of range of hostile fire, it becomes valuable as a high observation tower.

Dirigible balloons have been brought to a state of perfection that admits of almost perfect control as to direction and elevation, and they have attained a speed approximating twenty-five miles an hour. One of the Zeppelin dirigibles has carried twenty-five passengers. Germany, France and Spain are among the European powers having regularly organized balloon corps. In the United States the work is carried on as a branch of the Signal Corps since the uses appear to pertain more to the gaining and transmission of information than to any other branch of warfare.

Of the heavier-than-air flying-machines there are four general types based on the method of elevation and propulsion. These are: (1) heliocopters, (2) ornithopters, (3) feathering paddlers, (4) aeroplanes.

It has long been recognized that the problem of heavier-than-air machines is embraced in the solutions of rising from the ground and control after rising. The question of propulsion, once serious, has been simplified by the perfecting of gas-engines in motor-boat, motocycle and automobile manufacture.

Heliocopters are based on the lifting-power of a propeller rotated rapidly on a vertical axis. The questions of ultimate angle of tip, control of direction and propulsion have not yet been solved, nor has a successful man-carrying heliocopter yet been constructed. One apparent danger to this type is the resulting fall should power be temporarily shut off from the lifting-propeller while in the air.

Ornithopters present the first, logical solution of the question of flight, being based upon the commonest known natural flight phenomenon—that of the flapping-flight of birds. However, paradoxical as it may seem, mankind has not yet been successful in solving this problem.

Feathering paddlers depend upon the lifting-power of a curved, horizontal surface moved rapidly downward and returned to the top position while lying edgewise to the horizontal plane. A number of such surfaces follow each other somewhat on the principle of a chain of dredge-buckets. There are no successful paddlers as yet.

Aeroplanes (more properly aerocurves) are the only successful heavier-than-air machines at the present writing. They depend upon the principles of soaring-bird flight, and for purposes of differentiation are divided into: (1) monoplanes, (2) biplanes, and (3) multiplanes. As these names imply, monoplanes have but one wing-surface; biplanes have two superposed wing-surfaces, and multiplanes have more than two superposed wing-surfaces. There have been no really successful multiplanes as yet. From which it is seen that a real description of successful heavier-than-air machines is complete in a discussion of the monoplane and biplane types.

Accepting, then, as we must, the fact monoplanes and biplanes cover the best in all present development of air-craft, there are a number of interesting points with regard to the two types which are of general interest and regarding which the general public has great difficulty in obtaining information.

In elucidating some of these points one of the most important is the question of ultimate size and utility. In regard to this

it is safe to state that there is speedily reached a maximum size, and that, unless some new method of producing power with relatively lighter engines is discovered, there will be no air-craft analogous to railway trains or steamships. This is made clear when it is remembered that two superposed planes of equal areas increase the lifting and sustaining-power of a single plane by but one-fifth; that all areas (wing-spreads) increase as the product of two dimensions —length and breadth; while all solids (engines) increase as the product of three dimensions—length, breadth and thickness. Just where these three factors will cause a stoppage of increasing size has not been worked out.

Courtlandt Bishop, President of the Aero Club of America

However, the loss from a commercial standpoint through relatively small carrying units will be more than compensated for in the increased individual initiative of those who fly in the air, for where there are but few to transport the question of route, speed and stopping points is left more freely to those carried, and there is a resultant advantage in personal pleasure.

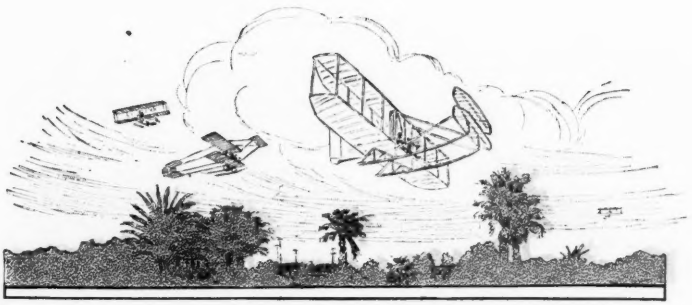
From this it might be concluded that aeroplanes are to be vehicles for the wealthy only, yet such a conclusion is not necessarily correct, for the initial cost of construction is not great, owing to the cheapness of materials used and to the constantly decreasing cost of engines. Maintenance cost should be light as the small power needed for propulsion and lack of resistant road-surfaces will undoubtedly present decided advantages over land vehicles. Furthermore, anyone possessing the necessary data can construct an aeroplane, thus avoiding the high cost of expensive factories.

The question of physical hazard in using an aeroplane has a deterrent effect upon many who might otherwise take up the active use of these machines. There have been but five fatal accidents in the history of aeroplane flights since power has been placed in the machines. Not one of these is traceable to faulty principles of construction or control. In each case the accident has been the result of some part breaking or becoming unfastened. In other words, the danger lies not in the principles involved but in man's carelessness, recklessness or inability to foresee possible dangers from defects of material. Breaks in the steering-gear of automobiles are analogous to propeller breaks in flying-machines, and they have been conducive to many more fatalities. At present aeroplanes are in the exploiting stage, and owing to their size, it is necessary that they be readily taken to pieces for transporting. In assembling there are numerous wires and nuts and bolts, many pieces of wood, bamboo and metal. Each one of these must be absolutely flawless to insure safety. When this fact is fully understood, and owners of flying-machines put them in permanent commission, locking or burring all nuts, soldering all wire joints, microscopically examining all propellers and other woodwork, and, similarly, testing out every detail of the apparatus, then the safety of aerial flight will become equal to or greater than that of any other method of transportation. This must of necessity follow since the wear and tear on machinery is subjected to less strain than when traversing through either the water or on the land, and since there are no bearing parts in contact with resistance other than that of air.

A question ever present in the minds of all who contemplate the possibility of aerial flight is that of the result should power be shut off while in the air. In the monoplanes and biplanes that have been successful, this question has been answered many times by accidental and intentional stoppages. Just so long as there is sufficient clear space beneath to admit of a landing within an area of flight comprehended within that distance of flight remaining as a result of previously acquired momentum, the aviator and his vehicle are perfectly safe. In other words, control as to direction and equilibrium is not lost merely because power is shut off. The ability to soar great distances *is* lost.

(*Continued on page 345*)

Looking down upon the beautiful birdlike Bleriot monoplane as it flew above the audience
Photographed by A. C. Pillsbury from a captive balloon



Western Men Who Would Fly

By PITT P. HAND

THE great outdoors of the country is destined to be the source of the most widespread experimentation in air-travel as well as the favorite exhibition ground of the successful aviator.

Western America to-day, without having as yet produced a single air-ship of world-famous success, probably could enroll a greater percentage of air-travel experimenters than the eastern or southern states or the nations of Europe.

The advanced stage of the new passion in the public mind is shown by the recent offer of a prize of one hundred dollars to the schoolboy or girl who constructs the best model of a flying-machine by the Pacific Aero Club of San Francisco. This offer already has inspired hundreds of schoolboys who are past masters in the art of kite-flying to spend their hours seeking to conjure up a box-kite that will prove the ideal type of a heavier-than-air sky-car. This movement to encourage even the schoolboys to delve into air-ship invention has received the general approval of educators, and flying is now a part of the Western curriculum.

At a recent competition in composition in the Fremont Grammar School of San Francisco, the two medal winners, Frank Dowsett and Irwin Meyers, each fourteen years old, took "Aviation" as the subject of their successful essays and betrayed a thorough study and remarkable understanding of the air-travel problem.

Long before Bleriot sprang to world-fame by his epoch-making feat of flying over the English channel, two young Westerners were constructing a machine which, it is now discovered, is almost a prototype of the French wizard's monoplane. These two inventors are John W. Hudson and Clifton O'Brien, of San Francisco, who now have a perfected monoplane with which they confidently expect to surpass the feats of Bleriot. Their machine, differs from Bleriot's chiefly in that it is equipped with a revolving engine. The engine has seven cylinders and its revolutions acts as a gyroscope, doing away with the necessity of a flywheel and acting as a balance.

When the great international aerial tourney riveted the attention of an astonished world upon Bethany Field, at Rheims, France, last August, and in one week brought aviation from the status of a hazy dream to that of a splendid living reality in the public mind—it gave a tremendous impetus to experimentation already under way throughout the West. The great Los Angeles meet was a still greater stimulus to Western inventiveness.

PIONEER BIPLANE INVENTOR

San Francisco has a pioneer air-ship inventor in the person of Sylvester M. Williams, a retired photographer sixty years

old, residing at 816 Oak street. Mr. Williams is one of the earliest, if not the very first, of all experimenters in the field of heavier-than-air flying-machines or aeroplanes, lifted without the sustaining force of any gas bags. He has worked upon the problem since boyhood, and during forty years of active experimentation has made and discarded more than twenty distinctive ships and models. Now he has perfected a biplane, for which, after many tests, he makes claims that are sensational. The Williams machine as now perfected, is declared to be an actual commercial utility. The inventor declares that in it he will be able to fly from San Francisco to New York, to pass safely through any kind of weather, any storm or atmospheric condition, and to carry fifteen passengers or their equivalent in weight.

"The Wright brothers, Curtiss, Latham, Farman, Bleriot and the rest are to-day just where I was years and years ago," declares Mr. Williams. "I determined to refrain from producing publicly any aeroplane that was a plaything or dangerous and not perfect for safe public travel and commercial use. Now I am ready and have a biplane-aeroplane that will mark the longest forward stride yet made in aerial navigation, and will prove a world-wide sensation."

Mr. Williams has won honor in other fields of invention. He is the inventor of a flashlight photographing device, which was awarded first prize in competition with improved methods at the exposition in Chicago. Also he is the inventor of the retouching method and the enameling process now in general use in photography everywhere. These inventions have yielded him a comfortable fortune.

Pacific Aero Club's Machines

If one-half of the air-craft now in course of construction are successful in mastering the law of gravitation, the West will be able to send a formidable and novel fleet of flying devices and a horde of sky-pilots to the next aerial tourney to compete with the wizards of the East and of Europe The Pacific Aero Club, a new organization embracing devotees only of San Francisco and environs, already enrolls over fifty heavier-than-air machines.

One San Francisco lad, Cleve T. Shaffer, of the Potrero district, has perfected a soaring machine that he is now manufacturing for the market. He has the first air-ship factory in the West and is advertising for business. The Shaffer glider is marketed as a pleasure device. The pastime of scudding over fields at lightning speed is recommended as entirely safe and most exhilarating. Shaffer is twenty years old.

While building his gliders for the trade Shaffer, in a shop established in the rear of his home at 302 Holyoke street, is fitting an enlarged glider with a power motor which he declares will make of it a biplane-aeroplane superior to those of the Wrights, Bleriot, Curtiss, Latham, Paulhan, and the other aviators already famous.

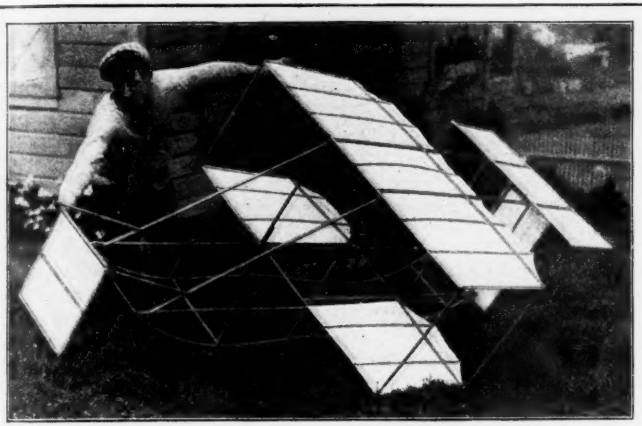
Shaffer is secretary of the Pacific Aero Club, the lively little organization of air-travel zealots which has sprung from the widespread interest in the new field of experimentation in San Francisco. The story of Shaffer's efforts to solve the aviation problem is inspiring. Though a mere boy, he is a "pioneer" in aerial experimentation. Without funds and without any suggestion, support or encouragement from older persons, Shaffer as a boy of fifteen years, at a time when aviation was a subject engaging the attention of only a handful of men in the entire world, began persistent and systematic experiments. The lad became the laughingstock of his home district in the Potrero hills. He was looked upon as a freak, a child with something wrong in his make-up—because of his unquenchable mania for air-travel experiments.

Flies Little Sister

Now he is considered a prodigy, and is honored with the secretary-ship of the organization of all the most successful local experimenters. Vindication has come to Shaffer fully, for the contagion of the "air-ship idea" has spread to such an extent that his next-door neighbor, Alfred Biniartz, who for years was constant in his ridicule of the boy, has contracted the passion, constructed a model, and to-day is a confirmed aerial experimenter.

Shaffer began as a little boy by building box-kites, which embody the primal principle of all aeroplanes, biplanes and monoplanes. He built and flew box-kites of varied sizes and patterns by the score, studying their antics in the strong winds that sweep from the ocean at all times of the year. In conjunction with his kite

tests he made a study from life of the sea-gulls—the most perfect and graceful soaring birds known. From observations of the graceful gulls, he fashioned wings and planes upon his best box-kites and watched their



The biplane glider built by Alfred Biniartz of San Francisco

effect upon the flights. It was original experimentation with Shaffer, for in those days there existed no publications upon aeronautics, and he had no advantage of precept or advice from the experience of others.

The neighborhood was startled one day by Shaffer lugging from his shed to the hilltop the most gigantic and grotesque box-kite they had ever seen. It was a framework of bamboo, strongly wired, with stout cloth of window-shades forming the covering of the planes and wings. With Shaffer trudged his little sister—the children silently and determinedly clambering to the top of the loftiest hill which was surrounded by grassy fields. Little Miss Shaffer mounted the lower bars of the frame after it had been perched at the edge of a sharp declivity, and the lad stood at the bottom holding a stout rope attached to the front of the kite-aeroplane.

With all in readiness for this crucial experiment, Shaffer gave the rope a tremendous jerk, launching the machine off the precipice, and then started running across the field at top speed with the towline. As the machine dived downward into the air the boy pulled harder and ran faster and faster. It dipped and plunged, but in the face of the stiff sea-breeze, with its little human freight, it mounted upward, steady and true, and finally soared.

It was Shaffer's greatest kite. Here he had embodied all the merits, all the tried principles, all the original ideas developed in the making and flying of a hundred kites during two years of unflagging toil. The boy sailed his

Prof. Jos. Hidalgo, of the University of California, and Herman Bulask, student and mechanic, discussing plans for their projected aeroplane

little sister between sixty and seventy-five feet in the air—raising and lowering her at will. She was unterrified, and so was he.

Then the neighborhood awoke to Shaffer. The scoffers became interested supporters who proffered aid. The men who had laughed at him now praised and encouraged him. After this the flying of men and boys on Shaffer's kite became a common sight in the Potrero. With a team of two

or three fleet runners carrying the tow-rope against a strong wind, Shaffer went up to dizzy heights. Shaffer, meanwhile, with meager resources and primitive methods, has proceeded with the perfection of his biplane glider, until now he is able to step off the crest of the hill and soar and pirouette over the fields in marvelous fashion without any motive power whatever. Adventurous persons who have watched his flights have given him orders for similar machines which he is now constructing. Meanwhile, he is attaching to his latest and largest glider a small engine whose propulsion will take the place of the tow-rope and give him a full-fledged aeroplane. For his flights with power Shaffer is constructing a seventy-five-foot tower, to the top of which he will hoist his machine for the starts.

Youngest of Aviators

Youngest of all the San Francisco aviators who have attained some degree of success is Clyde Payne, Jr., fifteen years old, and a student in the Lowell High School. Young Payne has constructed a biplane without power attachment after the pattern of the Wright brothers' machine, performing all of the work himself in a barn back of the family residence at 1350 Jones street. The beardless aviator claims an improvement on the Wright invention, however, in the form of a balancing device designed automatically to maintain the equilibrium. The machine constructed has two canvas planes twenty feet long and three and one-half feet wide, one four feet above the other, and with power is estimated to have a lifting-power of four hundred and twenty pounds.

The lad has soared successfully in the sand-dunes beyond Golden Gate Park, and is ambitiously planning a larger machine to be driven by a powerful gasoline engine. He declares that in this he will fly over downtown San Francisco.

College Men at Work

Another young Californian whose ideas have followed closely those of the Wright brothers, although reaching his conclusions by independent and original work, is Herman Bulask, a student of the University of California at Berkeley, who is also a practical mechanic and machinist. His aeroplane will resemble the Wrights', with the same motive power, but is operated upon entirely different principles which the inventor confidently believes are superior.

Bulask has experimented in aeronautics continuously for more than three years past, and is now constructing an aeroplane which combines all the best points proved by tests with many models and experimental craft. He has had as an enthusiastic and valuable associate in his work one of the University professors, Joseph Hidalgo, instructor of languages, who now shares his confidence that they have solved aerial navigation; at least, as regards the heavier-than-air machines.

The University inventor declares that aeroplane travel is neither difficult nor dangerous, as all flights may be made along a slight elevation from earth. He expects to see his ship attain tremendous speed, however, and to fly the five hundred miles from San Francisco to Los Angeles, surmounting the high Tehachapi mountains, within the next few months.

These inventors have gone into the study of aeronautics deeply and exhaustively, and their calculations are based upon scientific principles and tests.

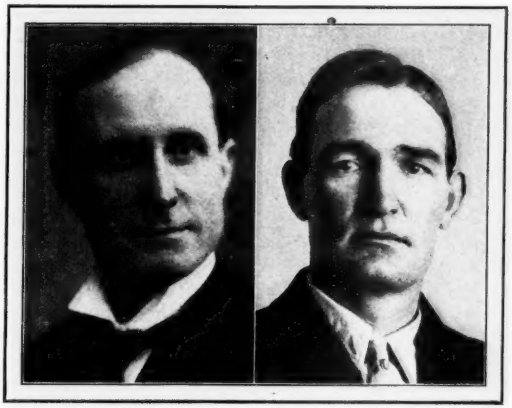
Few accidents, none of consequence, have marked the extended experiments in this section of aerial travel. Joseph Bettancourt, John Driver and Bertram Aber, of San Leandro met with several minor accidents in flights with a novel type of glider, but undaunted, they are now preparing to attempt a flight from the top of the hills above Lake Chabot across San Leandro to the bay at an elevation of eight hundred feet, which is the loftiest ascent attempted in machines without power in San Francisco.

Back to First Principles

Perhaps the most interesting and radical departure of all the novel contributions by Californians to the world of aeronautics—certainly the one that has attracted the most widespread attention and comment from the scientists actively engaged in the great problem of overcoming the law of gravitation—is the product of Charlemagne Sirch, a civil and electrical engineer of Los Angeles, who has perfected and marketed a number of mechanical inventions of note during the past five years.

Sirch, resolutely disregarding the dictum of most scientists, goes back to first principles and adapts methods which were used at the very beginning of any travel by human beings above the surface of the earth. The first device that ever carried men upward from the earth was a crude sack of ordinary

sheeting filled with heated air and smoke from a bonfire by the two brothers Montgolfier, at Annonay, France, in 1782. One of these brothers, while the two were seated at a café table after a repast, carelessly threw a lighted match into his empty coffee-cup, then cast a partly-crumpled tissue-paper napkin on top of it. By mere chance the napkin had been formed into a bag, and the hot air rising from the smouldering match gathered within and raised up out of the cup the first known balloon. The brothers were impressed, pondered, and then began experimenting.



J. C. Irvine, President of the Pacific Aero Club

Leonard H. Lane, Mechanical Engineer, West Berkeley

From this small incident grew the common hot-air balloon with which adventurers have been making ascents and parachute drops all over the globe for over a century.

The two discoverers became zealous and daring aeronauts. In the greatest balloon of their career they ascended several thousand feet in the air and carried with them on a platform a cook stove weighing nearly one thousand pounds, from which the hot air was conveyed upward into the big cloth bag by means of a long stovepipe.

Awe-struck multitudes witnessed the frequent ascensions of the Montgolfier brothers throughout Europe, and they were hailed as the conquerors of the air. In their ascents they used damp straw as the lightest fuel available, carrying it in sheaths attached to ropes which trailed downward from them for hundreds of feet. When their fuel supply was exhausted and the air cooled they settled slowly to earth.

Modern practice never has improved upon the original hot-air balloon. Rather have subsequent changes in minor detail been steps backward instead of forward in the utilization of this method of air-travel. There has been no attempt at long-sustained flight by heated air. Later flights were made without carrying fuel or heating apparatus; instead, the latter-day aeronauts have lashed their bags to earth, filled them to the limit of their capacity with heated air by means of petroleum fires emptying out of earthen caves, then have shot swiftly to enormous heights and immediately dropped to earth in parachutes.

Then to clinch the abandonment of hot-air bags as a part of modern aeronautics has come the generally-accepted verdict of aeronauts and scientists that this means of sustaining power has reached its utmost development and that it is worthless in the utility of the problem.

To Harness Hot Air

Now comes inventor Sirch with a return to this primal principle. Sirch proposes to harness the lifting-power of torrid pure air, and to keep his air heated while in flight, but to improve upon the cook stove and wet straw as a method. This has proved a rather startling announcement, and has attracted wide attention in the scientific world, being coupled with sane, mathematical and plausible plans. Indeed, many leaders in aerial experimentation, upon thorough examination of Sirch's remarkable plans, have declared that it is entirely possible that he has found the key to a most important method of aviation. The calculations of Sirch, upon which he already has perfected American and foreign patents, are declared to be as simple and absolute as mathematics regarding the lifting-power of heated air and other fundamental principles. Heated pure air has considerably greater lifting-power than hydrogen-gas, at the same time being non-expensive and non-injurious to its containing-bag.

The details of this air-craft, which the inventor has christened "The Sirch Transport," are no less surprising and interesting than its radical basic principle.

Sirch has evolved, to contain the heated atmosphere, a rigid bag in the form of a projectile, through the center of which runs the major shaft of the metal frame. The covering itself is an invention, being of canvas subjected to a patented treatment of gelatine and asbestos, which renders it impervious to fire or water. The bag, which is divided into eight chambers, is held rigid by stout ribs extending out from the central shaft that traverses it from end to end. At each end of the steel shaft is a revolving gasoline engine coupled to the propeller-blades. Both engine and propellers whirl with the shaft as their axis.

Thus the horizontal main shaft, rigid as an arrow, is driven through the air by the two engines upon its ends, being sustained meanwhile, by the bag of heated air which surrounds it. This gives it the compact, direct, rigid traveling force of a projectile.

The method of maintaining the necessary high temperature of the air while in flight aloft is in consonance with the other unique features of the machine. This is done by utilization of the exhaust from the gasoline engines which whirl the propellers, and is declared to be the most simple and certain part of the device, if it is somewhat unique. The constant explosions of the gasoline drive the propellers as in the automobile, but the heat properties in the automobile and in gasoline engines generally, escape and are utterly wasted in the hot blasts from the exhaust pipe. In Sirch's "transport," the exhaust pipe from each engine is diverted to travel by means of circular coils of pipe similar to the ordinary radiator, through the chambers of the bag, thus keeping the air therein constantly at high temperature.

Expects to Compete With Railroads

The carriage and pilot-house of the "transport" hang close beneath the bag, held rigid by steel braces leading from the main shaft. A long hanging platform or deck provides access during flight to the engines and propellers at either end. It carries also a small and simple device for a supplementary supply of hot air, which is conveyed directly into the chambers from apertures beneath. The bag need not be air-tight, as the hot air rises—and explosions, such as wrecked Zeppelin are impossible.

As an aid to flight, but of minor importance, are attached two long planes or wings, which are "reefable" and may be extended or drawn in at will to take advantage of favoring winds or air-currents.

Sirch flatly declares that in his lifetime his "transports" will become competitors of the transcontinental railroads in the carrying of both freight and passengers. He has constructed several small types, each of which he declares have proved true to the uttermost every essential principle of his machine. He has now commenced to build a large example of his ship which he says will carry twenty passengers from Los Angeles to San Francisco, with fuel, provisions and comforts for the trip. Sirch is president and general manager of the Sirch electrical and testing laboratories, a manufacturing corporation with a large plant at the corner of Sixth and Hope streets, Los Angeles.

Dirigibles in Disfavor

The Pacific Aero Club, the organization of San Francisco aviators, is in its infancy. It has a membership of about one hundred only, but every man enrolled is a consecrated devotee of the new passion for travel in the air.

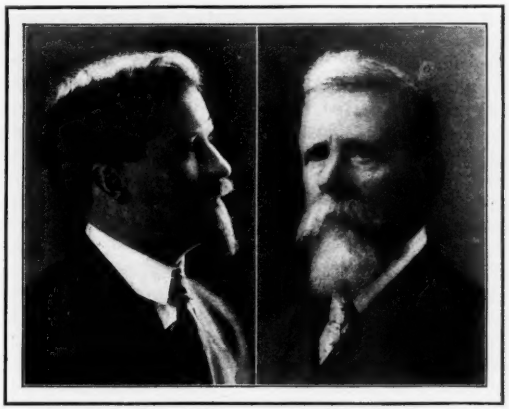
Almost to a man, the Aero Club members are toilers in the field of heavier-than-air machines. In fact, the balloonist is looked upon as a "back number"—as one misguided—wasting time with a disproved, discarded, impracticable and academic form of air-travel. The balloon is a known quantity—the aeroplane is a fascinating uncertainty—the balloon is an economic failure for air-travel—the aeroplane is a partial success.

The aeroplane aviators point out, first of all, that the balloon is so expensive as to preclude practical commercial utility or such general use as to be of value. The cost of hydrogen-gas and of the silk containing-bags is very great, the work of proper inflation considerable, and the deterioration ruinous. A silken balloon is made worthless by fifty successive inflations with hydrogen-gas. Control is made exceedingly difficult and the length of flights are definitely limited by expansion, contraction and escape of gas under varying atmospheric conditions.

The Aero Club members therefore have relegated ballooning to the realm of futility, and are devoting all of their energies toward perfecting flying-machines which will raise and carry weight without the assistance of any bags of gas whatever. They are

interested only in straight "heavier-than-air" flying-machines.

Not ten per cent of California air-ship experimenters, however, are members of the Pacific Aero Club. Its membership comprises only the most confirmed and devoted "cranks" on the alluring new field of endeavor. Recently, the Aero Club gave an "Air-ship Show" at the Dreamland Rink, San Francisco, which was the first exhibition of its kind given on the Pacific Coast. Twenty-five machines and models were shown, and students and inventors delivered lectures upon various phases of aeronautics.



Charlemagne Sirch, Electrical Engineer, Los Angeles

Sylvester L. Williams, a pioneer California aviator

The types were amazing in their variety, and ranged all the way from an ordinary wind-wagon, or sailing-vessel on wheels, to helicoplanes and aerocycloids of the most fantastic patterns. No imagination could conceive the strange devices produced by these wits of the air-ship world.

The "air-ship passion" has hit at random, and struck men and women of all age, occupation and circumstance in life, as an examination of the Aero Club membership list discloses. The members include capitalists, professional men, mechanics, scholars and dilettantes.

Fantastic Aerocycloid

The president of the Aero Club, J. C. Irvine, is a manufacturer of dies, stamps and medals. He has invented a most fantastic machine, a sort of air-velocipede, which he has named an "aerocycloid," and in which he proposes to pedal straight up to the skies. Accompanying this article is a photograph of President Irvine's "aerocycloid." It is an arrangement of fans which revolve between a double-wheel, propelled by a chain attached to pedal and sprockets located at the seat of the manipulator below.

One may ride into the air on Irvine's machine by foot-power just the same as we now ride horizontally along the ground upon a bicycle. The inventor has proved the lifting-power of his aerocycloid, and he is now developing the idea by attaching planes that will enable him to soar upon the wind. He may travel in any direction merely by going to a height where he finds the proper air-current, then drifting along by aeroplanes on the breast of favorable billows. The leg-power of the pedals will be supplemented by a small motor and folding wings will be attached to assist the planes in breaking too-rapid descent.

Irvine named his machine an "aerocycloid," because of its strong resemblance to a bicycle.

There are two wheels mounted at the top of a light bamboo frame, on which rests the engine and the seat of the driver. These wheels revolve upon a fixed shaft, and at points of the periphery of the wheels equidistant from each other, are huge round planes, fixed on revolving shafts. The power is conducted from the pedals and engine below to the big wheels by bands extending around the periphery of the large wheels. On one of these is a big sprocket from which bands run to smaller sprockets on the planes. When the big wheels are turning the sprockets conduct power to the planes, and these turn also, making half a revolution on their own axes each time the big wheels make a complete revolution. This brings the planes at different passages through the air, going down or coming up, at correct angles for lifting.

In the position shown in the picture the propelling-planes are exerting their whole force in lifting. When the proper height is attained, the sprocket-wheels are rotated to give the propeller-blades proper angles creating downward and backward

air-currents, and the machine travels forward. By reversing the position, the machine will travel backward, accomplishing satisfactorily something which no other machine has thus far attempted.

The aerocycloid is built upon the gyroscope principle and the weight of the machine is below the center of lift. Thus, if it should lose the line of incidence—for instance, if it should become overbalanced by a sudden gust of wind, the rapid rotation of the propeller-blade would right the whole contrivance immediately. It has no rudder, but direction is easily changed by retarding the action of one or more propellers, very much as direction is changed by a side-wheel steamer, through stopping the starboard or port wheel.

The inventor claims for the aerocycloid many advantages over the common type of aeroplane. In the first place it has a much more rigid construction—it is not so great in length, thus requiring less space for housing, for alighting or rising. Again, it has a straight upward lift, thus enabling it to arise even in a crowded street, and descend in the same place, whereas an aeroplane must have plenty of "sea-room" to perform both actions, and the least interference with its delicate planes means a broken machine. Third, it will stand still in the air, hover or dash, all of which are great conveniences in reconnoitering, and for active warfare, as well as for pleasure.

The picture of the aerocycloid shown herewith is that of a model fitted with a three-horsepower engine. With this Mr. Irvine succeeded in lifting one hundred and five pounds, or thirty-five pounds per horsepower, which is more than any flying-machine of any type has thus far been recorded as doing.

The vice-president of the Aero Club is Charles C. Bradley, an official of the Crocker National Bank, where the headquarters of the organization are maintained and weekly meetings held. Bradley is the inventor of a biplane. Joseph Master is treasurer of the club.

The Aero Club proposes to hold regular exhibitions at frequent intervals to interest the public in aeronautics and give inventors full opportunity to display their ideas. Also the organization will establish a fund from which financial aid may be given to worthy inventors in their work of experimentation. A proving ground, with proper elevated mounds and storage sheds for flying-machines, will be established and maintained.

Two college instructors, Professor Bruno Heyman, teacher of mechanics in the Lick School, and Professor Joseph Hidalgo, teacher of romance languages in the University of California, are among the active members of the club. Prof. Hidalgo's monoplane model has attracted much attention for its perfection of detail. Joseph Rosenthal, a well-known capitalist, is one of the most active members in promoting aerial experimentation.

Other members of the Aero Club who are active participants in the sport, and who have supplied themselves with models of machines from which they are building actual flying-machines are A. C. Pillsbury, J. Z. Posadas, Jr., C. C. Bradley, Captain P. A. Van Tassell, George Stanley, A. C. Watkins, Claude De Haven, Leo Kowalkowski. There are innumerable others who have been engaged in designing machines which are as yet merely on paper, but which will take form as soon as the designs are completed.

Dentist Builds Helicoplane

It has remained for a dentist, Dr. A. J. Hiniker, to take the lead in the club in the range of the more complex machines. Dr. Hiniker has invented and built a "helicoplane" which was exhibited at a recent air-ship show, and attracted wide attention, because it is absolutely unique and the only machine of its kind ever evolved. The "helicoplane" is a combination of the two principles embodied in the heliocopter and the aeroplane. It is now being fitted with specially-designed engines and, while its possibilities are conjectural, all the experienced aviators declare it certain that it will ascend and also navigate, only its speed and flexibility being in doubt.

The helicoplane is unique, for while the heliocopter and the aeroplane have been familiarly known for sometime, the possibility of uniting the two in one machine and thus getting the best action from each seems to have occurred to Dr. Hiniker first.

The aeroplane construction is a simple enlargement of the box-kite principle. It consists of planes which are presented to the air surface at different angles, according as the driver would rise, soar, fly or descend. The machine is dragged through the air by a propeller in front and takes the name

of monoplane, biplane, triplane, and so on, from the number of planes. The Wright machine is a biplane-aeroplane, having two planes one above the other, between which the driver sits. The Bleriot machine, the one to first cross the English channel, has only one plane and is therefore a monoplane. Triplanes are not popular and none of them have achieved any distinction in the realms of the air.

A heliocopter is an altogether different thing. An aeroplane lifts by being forced against the wind, exactly in the same manner as a kite lifts when it is pulled against the wind. A heliocopter rises by the fast revolution of a series of vertical propellers.

When you were a child you often amused yourself by twisting a piece of spirally-cut cardboard about one end of a lead pencil, rapidly revolving the pencil thus equipped by dragging it through the hands, each moving in an opposite direction, quickly releasing the thing and watching it soar upward as it continued to turn from the momentum imparted. When you did that you were experimenting with the principle which governs the present-day heliocopter, probably the most scientific of the flying-machines of the present.

The uniting of these two principles is what Dr. Hiniker has attempted, and those scientists who have examined the machine, both with and without club membership, are unanimous in their praise of it and their belief in its possibilities.

Having the resistance of the aeroplane in its lift and the direct assistance of the heliocopter principle in combination, it is believed it will be more steady and more sure in the air than any other form of flying-machine that has, as yet, occurred to the mind of man.

A Giant Heliocopter

The heliocopter, or top-principle lifter, has a number of devotees among the California inventors. In fact, the costliest of all the machines constructed in California have been built upon this principle.

Peter and W. P. English, father and son, have constructed in guarded secrecy at Sather station, Fruitvale, near Oakland, a heliocopter so mammoth and elaborate that they have already expended upon it nearly $10,000. This token of confidence in success of the idea follows one year of experiments which have amply proved the lifting-power of the apparatus. The Englishes, who are practical machinists, have incorporated a million-dollar company to handle their heliocopter.

The English has at its top two gigantic adjustable-disk propellers, lying horizontally at each end of an upper truss, each of which by forced spinning is capable of lifting nearly one thousand pounds. The propellers are twenty feet in diameter and are driven by a seventy-five horsepower, eight cylinder, water-cooling gasoline engine. Two curved planes with eight hundred square feet of supporting surface for soaring extend over the top of the machine. This auxiliary aeroplane canopy being of finest prepared silk. The framework, which is of nickel tubing and brass, provides an operating platform at the bottom, which bears seventy-five per cent of the weight and gives equilibrium. As the total weight of the machine is six hundred and fifty pounds, the great and powerful propellers are figured to provide such a tremendous surplus lifting-power, that the completed heliocopter will easily carry four or five persons.

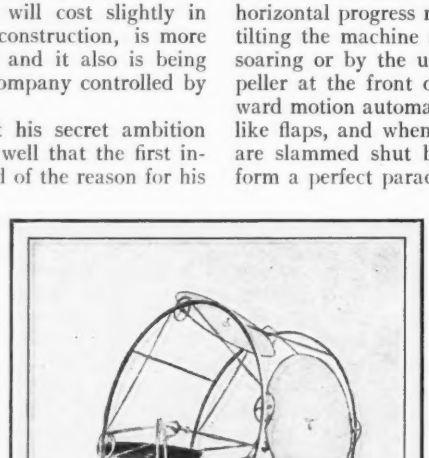
The idea of the machine is to make a straight ascent by the horizontal whirling of the propeller-wheels, then travel at will both by soaring on gravity and by propulsion. Upon reaching the height desired, the propellers can be deflected by levers on the operating platform to vertical positions and utilized for driving the ship horizontally through the air while it rides on the sustaining power of the planes. Before commencing the construction of the large machine, the lifting-power of the arrangement was thoroughly tested by means of small models. The men have been at work on their large machine for six months past and expect to make a public flight over San Francisco bay before the close of the year. The English machine is kept under close watch in a large, specially-constructed shop at Fruitvale. Few persons have been permitted to inspect it and no photographs or drawings of the detail of its construction have been permitted.

Ascends on Compressed Air

Another most interesting air-ship of the heliocopter type under construction on an elaborate scale in San Francisco is that of Leonard H. Lane, of 1158 Francisco street, West Berkeley. Lane, who is a mechanical engineer, has spent several years in study

and experiment, from which he has evolved what he terms an "automatous heliocoptic aeroplane" that is remarkable in its detail. His machine, which will cost slightly in excess of $5,000 for construction, is more than half completed, and it also is being handled by a stock company controlled by the inventor.

This inventor kept his secret ambition to solve air-travel so well that the first information his wife had of the reason for his prolonged absences from home and considerable expenditures was when he came sailing down from the skies into the front yard one evening. Now his wife has developed into his most enthusiastic and intelligent helper in perfecting the great machine with which they both count on winning fame and fortune.



Aerocycloid, the fantastic air-craft built by President Irvine of the Pacific Aero Club

Lane's "automatous heliocoptic aeroplane" possesses several distinctive and entirely original features not included in any other California air-ship. Firstly, its propelling power is the expansion of compressed air, and this fundamental departure Lane has guarded zealously as to its detail. Secondly, the aeroplane feature is composed of automatically-opening and closing shutters or valves of aluminum. Thirdly, its lifting propellers all revolve around one central shaft, making the equilibrium as absolute and certain as that of a spinning-top.

The aeroplane portion of Lane's machine which covers the top like an enormous umbrella, is twenty feet wide by thirty feet long. In traveling this will present its broad side forward. The entire plane is composed of a series of thin sheets or plates of aluminum, similar to the scales of a fish. When the machine, in response to the whirling horizontal propellers, shoots upward, these plates hang downward, permitting the air to pass through without hindrance to the rise. When the desired height is attained horizontal progress may be begun either by tilting the machine slightly downward and soaring or by the use of a secondary propeller at the front of the ship. The sideward motion automatically closes the valve-like flaps, and when descent is begun they are slammed shut by the air-current, and form a perfect parachute for safe and slow descent. Supplementary to the main aeroplane are two side gliders or wings, which aid in sustaining the ship in flight or descent. For steering there is a two-way tail or rudder.

It is in his motive power of compressed air that Lane has his most radical departure and claims his greatest exclusive merit. Lane, in simple, proposes to create a gale beneath the sustaining surfaces of his ship, devoting a portion of this energy to driving his lifting propellers. The mechanism of the ship looks like two gigantic bicycles, laid sidewise, one on the top of the other. There is concentration of power for lifting by double whirling circles about the central shaft. The propeller-disks whirl about their own axes, and the wheels themselves revolve on their carriages around the big central shaft. The two sets of wheels go in opposite directions, compelling an even balance. The motors which generate the compressed-air power are placed with the operator's seat in the hanging carriage below. The machine complete weighs four hundred pounds.

"My system simply is to create the 'turn of the wind'—the thing sought and necessary for all aviation by artificial means," says Lane. "I can create by expansion of

compressed air a gale of from fifty to two hundred miles per hour, and in my machine I simply throw this tremendous power beneath a circular kite. I have proved its ample lifting-power. My four-hundred-pound machine will have a lifting-power of two thousand five hundred pounds."

Lane made five flights by means of compressed air last September and created a sensation with a cheap and primitive device designed simply to demonstrate the practicability of his theory. With a crude machine operated by hand and foot-power, surmounted by a small balloon and meager spread of wings, he rose from an open field in West Berkeley to a height of seventy-five feet and floated about over the tops of the trees and houses to the amazement of the townspeople. He remained aloft for seven minutes on one occasion, pumping desperately with hands and feet to continue the explosive expansion of air beneath the wings. Finally, exhausted by his terrible exertions at the pump-handles, he descended slowly, the wind by a peculiar chance wafting him and his strange device down to his own dooryard, where his astounded wife greeted him as he floated through the treetops and for the first time learned of his long-cherished ambition. On this and successive flights, Lane lifted a total of one hundred and sixty-two pounds dead weight with the compressed-air power.

Whirling Disk-Lifters

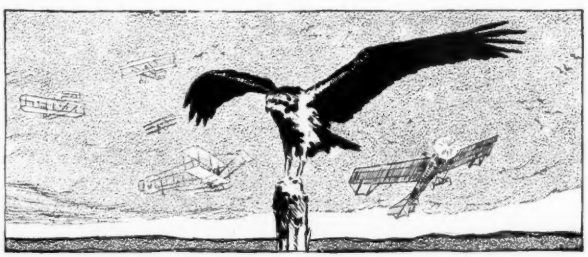
A third heliocopter of ambitious design and expensive construction, founded upon the same principle of lifting-power as that of the English and Lane machines, but different in other essential details, is that of Charles Stanley, an aviator whose enthusiasm and confidence is undaunted by the loss of a completed air-ship by fire on the day before he was to make his initial flight. The Stanley ship is in the last stages of equipment at No. 68 Fifteenth street, Oakland, and the inventor announces that he will surely circumnavigate the San Francisco bay and peninsula before next New Year's Day.

The two horizontal-lifting disks of the Stanley machine are fifteen feet in diameter. At either end of the ship are supplementary propellers eight feet in diameter; one pushing and the other pulling the craft horizontally through the air. Large monoplanes extend the full length of the ship at each side, which are to be utilized for soaring when the vertical lifters have raised the machine to sufficient height, and also to break the fall of the vessel in event of mishap to the engine. A fifty-horsepower gasoline engine furnishes the power.

Stanley also has devised a dirigible balloon which embodies the unique principle of reverse heliocopters that will pull the balloon down to the ground at any time without the necessity of releasing any hydrogen-gas from the envelope. This balloon, like the enormous Zeppelin craft, has a rigid envelope, the gas-bag being encased in conical aluminum shields which prevent sagging and flattening from air resistance and permit of high speed. There are propellers at each end, and Stanley claims he will attain far greater speed in this dirigible than that attained by Count Zeppelin.

West Offers Advantages

The splendid hills and vast open spaces of out-door California are an alluring invitation to soaring, and the result has been a vast amount of effort in the branch of aviation devoted to scudding and gliding on the winds without power. Many machines of various types, ranging all the way from mere shoulder-wings to broad, tent-like planes, have been constructed and tried with differing degrees of success.



Diamond Cut Diamond

or, The Fall of Oppenheim

By ARTHUR TRAIN

Author of THE PRISONER AT THE BAR; MORTMAIN, *Etc.*

DRAWINGS BY JOSEPH RAPHAEL

MARRY ME, ROSIE,
AND I WILL BUY THE RING AT
MOSES OPPENHEIM'S !

THIS treasure of literary ingenuity, placarded on high between an ode to the virtues of a breakfast food and a guaranty of the immortality of the boneless cod, flashes upon the dusty eye of the traveler approaching Sigel City just west of the slaughter-house—at once refreshing his weary mind with the thought of connubial happiness and stimulating his curiosity as to the identity and enterprise of Oppenheim.

"Marry me, Rosie!" Is it not, at one and the same time, masterful—yet nonchalant and debonair? Does it not combine most cunningly mere egotism with delusions of grandeur? Does it not leave the charmed observer impressed with the mysterious fascination of Rosie, me, and Oppenheim? And it lends itself to so many different and equally tantalizing accentuations. "Marry *me*, Rosie, and *I* will buy the ring at Oppenheim's"—thus intimating that if Rosie should marry anybody else the ring—or certainly one from Oppenheim's—may not be forthcoming. Or, emphasizing the anteultimate, penultimate, you have, "*Marry* me, Rosie, and I will buy the *ring* at Moses Oppenheim's," thus indicating that nothing less than actual marriage will produce the goods—a mere dallying or even an engagement not being sufficient. Instinctively we wonder who the mysterious Oppenheim may be. We speculate as to his age and appearance. We resolve to ascertain the whereabouts of his shop—our minds filled with visions of rows of sparkling gems gazed at by a bevy of beautiful Rosies—with one ornate, obsequious yet captivating Oppenheim in the background.

"The House of Oppenheim" stands upon the southwest corner of Main and School streets just opposite Habbakuk's drug store. Save for the insouciance of the "Rosie" sign everything about it bespeaks conservatism and respectability, as should the environment of the oldest and most prominent jewelers in a metropolis of two hundred and fifty thousand inhabitants. But its glory has departed.

Years ago if you had asked any of the prominent citizens loafing around Habbakuk's, who was the slickest man in town he would undoubtedly have answered "Moses Oppenheim"—but now he would hesitate or mayhap decline to answer on the ground that it would incriminate him. Thus in a day is a reputation lost forever—the work of a lifetime destroyed with a breath like a house of cards. Adolph Mayer remembers well the very moment

that the Old Man opened the street door that raw March afternoon and came in. "Dolph" had just called up the telephone office and got the girl to give him Western Union Time in order that he might set the "Perpetual Self-Correcting Electric Clock" directly connected with Washington, D. C., which was about seven minutes off its trolley—and it was just exactly forty-one minutes after two. Dolph had a wife and four small children, but he had not bought the ring at Oppenheim's (he knew that his employer figured two hundred per cent profit on "plain gold bands") and Moses had not offered to give him one. That was five years ago, and now his wife had developed several ailments, and trade had been very bad for a long time. Oppenheim growled every time he paid the clerk his seventy-five dollars at the end of each month and muttered threats of "changing their arrangement"—their present arrangement being that Mayer received fifteen per cent on the net profits in addition to his salary.

"It's a blust'ry *day!*" said the Old Man huskily, shaking his umbrella and stamping his feet.

"Good afternoon!" exclaimed Dolph, stepping forward politely and closing the door after the customer, for his quick eye had noted the neatness of the old gentleman's clothing and the fashionable cut of his overcoat—evidently not the product of Sigel City.

"Let me take your umbrella, sir!" exclaimed the salesman. "Thank you." He stood it against the wall and retired behind the counter rubbing his hands expectantly.

"Nothing would have brought me out in such weather," continued the Old Man, "except the fact that this is my golden wedding anniversary and I want to make my wife an appropriate present."

Dolph pricked up his ears.

"We have everything—largest line in town, sir," he interjected. "Have you decided on what you are going to get?"

"Not entirely," answered the Old Man, "But I am inclined to think a pair of earrings would be the most suitable—something really handsome, you know."

"This way, sir—the end counter."

Dolph's meager form trembled with excitement. There was a three hundred and twenty-five per cent profit on ear-drops—for Oppenheim purchased them free of duty from a gentleman who brought them in imbedded in a piece of chewing-gum carried in the mouth.

The clerk's little black curls danced and jiggled as he opened case after case for the old gentleman's inspection. They had not made a sale all day and Mayer wanted the satisfaction of negotiating this one entirely himself. But the old gentleman was hard to suit. When the gems seemed right the settings were not satisfactory. Each pair had to be examined separately and very carefully at the window and again under the electric light. The Old Man was very slow and his eyesight and hearing were poor. Moreover he asked a great many foolish questions, and it was nearly an hour before he had finally made his choice. The earrings selected were a beautiful pair of stones, set in plain settings and fastened with springs so that the ear did not have to be pierced. They were as good as anything in the store, and marked two thousand dollars, with ten per cent off for cash. The old gentleman seemed very much pleased, holding them up again and again and asking the clerk's opinion as to their purity. They had taken so long at it that the two had become very good friends—and as not infrequently happens the customer let drop a good deal of information about himself—as to how he and his wife were childless, usually spent their summers in Europe, how he was in the "farm mortgage" business in Merchants' Row and had a house on Elm avenue, and particularly as to how his wife's birthday and wedding day coincided so that it was a double festival.

"Those are just fine!" announced the Old Man for the sixteenth time. "My, won't Susan—I mean Mrs. Sigsbee—be pleased when she sees them!"

"She ought to!" echoed Dolph.

"How much did you say—eighteen hundred cash?" inquired Mr. Sigsbee. "Well, I'll just step over to the bank and cash this check for twenty-two hundred—Hello! It's after half-past three! Dear, dear! That's too bad!"

Mayer's heart sank. The bank was undoubtedly closed—all the banks closed at three—and the old man had nothing but a check for twenty-two hundred dollars.

"Won't it do if you have them in the morning?" asked Dolph.

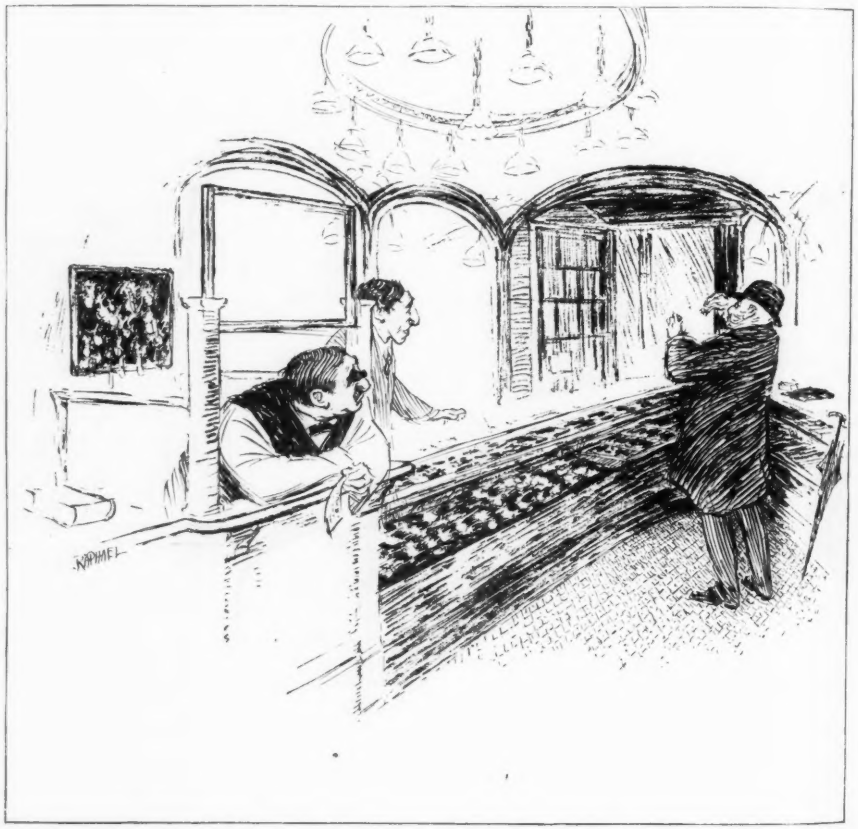
"Dear me, no!" answered the old gentleman, who seemed overwhelmed with

disappointment. "The anniversary would be all over. I wanted to present them to my wife at dinner to-night—some friends are coming for a quiet little celebration, you know—it's too bad," and he turned away.

Dolph was really very sorry for him. Poor old fellow! Married fifty years! two hundred and ten dollars—the idea was too much.

"Let me see the check," he said slowly.

"O, I don't expect you to cash the check," answered Sigsbee. "It's my own fault. I should have cashed it before coming. But I was in such a hurry to get the earrings."



Oppenheim snatched the check out of the clerk's hand and studied old Mr. Sigsbee with some attention

The salesman had been married five himself and knew how to pity anyone who had been married fifty! And then they would lose the sale! The diamonds had cost them only four hundred dollars and they would clear fourteen hundred dollars if they made the trade. Fifteen per cent on fourteen hundred dollars was two hundred and ten dollars. Nearly a quarter of his entire salary! Much as he pitied the old man Dolph pitied himself more. To lose

Dolph took the check and scrutinized it with care. It was made out to F. Silas Sigsbee and signed by W. W. Whitman—the President of the local Board of Trade. Dolph had seen Mr. Whitman's signature a thousand times and knew it well.

Mr. Sigsbee looked at him eagerly.

"Of course if you *would* cash it—it's all right. Mr. Whitman handed it to me himself this very morning in payment of an assigned mortgage."

Something told Dolph the check was absolutely good—and anyhow one look at old Mr. Sigsbee would have satisfied the most cautious salesman. He was almost ready to cash the check on his own responsibility—so anxious was he not to lose that two hundred and ten dollars.

"I'll speak to Mr. Oppenheim," he remarked shortly, and walked to the back of the store.

His employer was sitting in the rear of the shop busy at the interior of a watch. A microscope stuck in his right eye gave him a Cyclopean appearance, the ugliness of which was increased by his lank black hair and greasy, fat double-chin. Mayer hated him, and stood in deadly fear both of losing his job or having his percentage on the profits cut down. Oppenheim regarded Mayer as a worm.

"Mr. Oppenheim," said Mayer, "There's an old gentleman out there who wants to buy a pair of earrings for his wife—for an anniversary wedding present—but He's only got a check for twenty-two hundred dollars. He looks all right and—"

Oppenheim snatched the check out of the clerk's hand and peered at it with a scowl. Then he opened a little window that looked into the shop from above the desk at which he worked and studied old Mr. Sigsbee with some attention.

"That's Whitman's signature, all right," he said, "What did you say the old guy's name was?"

"Sigsbee," replied Dolph. "Quite the gentleman, he is, too!"

"Ask him for his card," ordered the employer.

Old Mr. Sigsbee readily responded to Mayer's request for his business card and Dolph handed it to Oppenheim.

F. SILAS SIGSBEE

FARM MORTGAGES

41 MERCHANTS' BLOCK

RESIDENCE
70 ELM AVENUE

"Looks all *right*—don't he?" inquired Dolph.

"Mind your own business," retorted Oppenheim.

Mayer said nothing.

"You might call up the bank," said Oppenheim. "Don't do it here. The old skate might get on his ear. Go over to the drug store. Meanwhile, I'll see if his name is in the directory."

So Dolph went over to the drug store and called up the bank, when he was informed that old Mr. Sigsbee was very well known there and in fact had been with the president that very morning in the latter's office. The president himself was away just then—off for the afternoon. But Dolph was satisfied and hurried across to the jewelry store. Oppenheim said it was O. K., that the old fellow lived at 70 Elm avenue all right, and told Dolph to let him have the sparklers.

"You are very considerate, I'm sure," said Mr. Sigsbee as Dolph put the earrings in a new white leather box and counted out four hundred dollars from the fireproof safe.

"Not at all—not at all," answered the salesman. "Kindly endorse the check over to Mr. Oppenheim—that's all that will be necessary."

Mr. Sigsbee wrote in a rather trembling hand:

"Pay to the order of
Moses Oppenheim.
F. Silas Sigsbee."

"That's right, ain't it? 'Moses'—that's right?"

"Sure thing," answered Dolph.

"Thank you again," returned Mr. Sigsbee, "You will have given two old people a great deal of pleasure. Drop in and see me sometime. Perhaps I can throw a good thing in your way—a farm mortgage or something. By the way I should be perfectly willing to leave the four hundred here until to-morrow morning, when the check will be honored, if you say so."

"We wouldn't hear of such a thing," said Dolph.

"That was a good sale, Mayer," remarked Oppenheim, after the old gentleman had gone. "I guess you never made two hundred and ten dollars easier in your life. I tell you this is a good job you've got. Many a chap would be glad to take it for the salary alone."

"I'm satisfied," answered Mayer.

After the children had been put to bed and while his wife was cleaning up the supper things Dolph sat reading the Sigel City *Chronicle* over his pipe. Once in a while

the recollection of the good sale to Mr. Sigsbee would come to him and he would chuckle with pleasure. Two hundred and ten didn't often come as easy as that! Nice old fellow too! By and by they played a game of backgammon and when it was over Dolph told his wife all about the earrings.

"Well," said his wife, "You don't need to get so excited about it. I daresay it is all right, but Mr. Whitman was out, wasn't he? What I don't see is how you can be sure the old man *was* anybody in particular."

"By George!" cried Dolph. "What do

"You old rascal!" he shouted. "Where are those diamonds?"

"Pretty good business, eh?" he asked. "Old Moses made nearly fourteen hundred net out of it."

"All right if the check is good," she answered.

"What!" shouted Dolph, almost jumping out of his chair. "Good! Of course it's good! We called up the bank and looked him up in the directory besides."

"How do you know he *was* Mr. Sigsbee?"

"How do I know it was Sigsbee!" shrieked Dolph. you try to scare a man so for! I'd like to know what more we could have done?"

"You could have waited until Mr. Whitman had verified the signature, for one thing," she answered. "And you could have telephoned to 70 Elm avenue and found out if Mr. Sigsbee was anywhere around, for another."

"You're crazy!" Mayer retorted. "Why there's no more chance of that check being bad than—than—"

"Than what?" asked his wife.

"Than that I'm a darn fool!" he concluded.

"That remains to be seen," she retorted grimly.

But although he would not acknowledge it even to himself his wife's remarks had sown the seed of anxiety in his breast. If the check *should* turn out a forgery! The perspiration broke out on his forehead at the mere thought of it. Diamonds gone—four hundred dollars gone! As the hours passed and he tossed sleeplessly upon his bed his fears grew. It was true. They had not taken all the steps within their power to protect themselves. If they had not been so anxious to make the sale it might have occurred to them to call up the Sigsbee residence and inquire for Mrs. Sigsbee. Perhaps there wasn't any! What if the old chap was some slick confidence man from New York? It was just as his wife had said—how did they know the old guy *was* Sigsbee. Unable to rest Mayer arose and lighting a lamp in the kitchen tried to read. But every page seemed crowded with items about swindlers and bank thieves. On one of them he came across an account of how some of the biggest stores in Maiden Lane had been victimized by an Old Man who had secured diamonds from them on memorandum. With a curse he threw down the paper and went back to bed. At breakfast he ate silently with a white face and as soon as it was over bolted from the house without kissing his wife. He had intended putting the check through the bank in the usual way requesting that it be first presented for acceptance, but such a method was too slow. The Old Man might be two hundred miles farther away by ten o'clock. He must get hold of Mr. Whitman at once. He looked up the address of the President of the Sigel Board of Trade and without losing a moment boarded a trolley. It was now nearly eight o'clock. As luck would have it Mr. Whitman was just sitting down to breakfast, and he came out into the front hall to see Mayer, who wasted no time on his errand.

"Is that your signature?" asked Dolph holding out the check.

Mr. Whitman slowly adjusted his spectacles.

"But just between you and me a feller has to get up pretty early to take in Moses Oppenheim"

"Hm!" he remarked at length. "It looks like mine, but I've given no check to Sigsbee that I recall. Why no! I've had no transactions with him for over a year!"

Mayer turned stone cold.

"Is—is it a forgery?" he stammered.

"Must be!" answered Whitman. "Clever piece of work, all right. Did you put up anything on it?"

"My future! That's all!" groaned Dolph. "He said he wanted to buy a pair of earrings for his wife—golden anniversary."

"Well, now! What do you think of that!" remarked Whitman sympathetically. "Sigsbee isn't married. Or if he is, I never heard of it."

Dolph rushed from the house with a cry of agony and rage. One more thing remained—the vain hope that there was some misapprehension or mistake—another Sigsbee perhaps—or something. At any rate he would take a chance and go to the address on the card—41 Merchants' Block. It took him twenty minutes to get to Main street and it was nearly a quarter to nine before he was flying up the wooden stairs from landing to landing breathlessly looking for No. 41. Three floors — four floors — 37-8, 39 — 40 — 41! There it was! And—Yes! There was "F. Silas Sigsbee. Farm Mortgages," on the glass of the rear room. Dolph's head swam and his heart pumped alarmingly but he staggered to the door, turned the knob and burst it open.

Mr. F. Silas Sigsbee sat calmly in the window at his desk smoking a cigar and reading the newspaper! A large safe stood against another wall. The whole room conveyed the same impression as Mr. Sigsbee—that of age and respectability.

"Bless my soul!" exclaimed the Old Man. "What on earth is the matter?"

Poor Dolph was so much taken aback at the astonishing vision of the old gentleman sitting there so tranquilly that he could scarcely speak. Moreover he had no breath left to speak with.

"I—you—" he gasped.

"Well, well, what is it?" queried the aged one.

Dolph wiped his brow with a handkerchief held in one hand while he pressed his side with the other.

"I—where—have you got those earrings?" he stammered huskily.

"Look here!" exclaimed Sigsbee laying down the paper and removing his cigar. "What's the matter with you! Of course I've got 'em."

Mayer gave vent to a suspiration of astounded relief.

"Where are they?" he continued panting.

Mr. Sigsbee arose from his chair and took Mayer by the arm.

"You're the young man from the jewelers, aren't you? Of course. Now what are you so excited for about the earrings? They're perfectly satisfactory and I haven't lost 'em either. My wife was simply delighted with them. The only thing is she isn't so crazy about the setting. I was going to bring them back and—"

"Bring them back!" stuttered Dolph.

"Say!" suddenly exclaimed Mr. Sigsbee. "They'll be putting you in the funny house next. I never saw such a fellow! You'll really have to explain yourself."

Now Dolph was not easily deceived and yet the old gentleman's manner was so sincere that it seemed impossible to believe that he was not telling the truth. He began to try to figure out how the conflicting facts in the case could be reconciled. Certainly the Old Man could not be a thief or a forger or he would have run away. On the other hand, the afternoon before he had stated that Mr. Whitman had signed the check in his presence. Whitman had stigmatized this as a lie.

"The fact is," blurted out Mayer, "Mr. Whitman says that check is a forgery!"

Mr. Sigsbee stared blankly at Mayer for fully half a minute.

"Well, what do you think of *that!*" he exclaimed finally.

His amazement was either genuine or assumed with a wonderful degree of histrionic ability.

"Why, the man is crazy!" he added. "Do you really mean that William Whitman, President of the Board of Trade, actually told you that he didn't sign that check?"

"That is what he said," returned Mayer.

"Then he is either out of his mind or a liar," said Mr. Sigsbee, with an air of utter disgust.

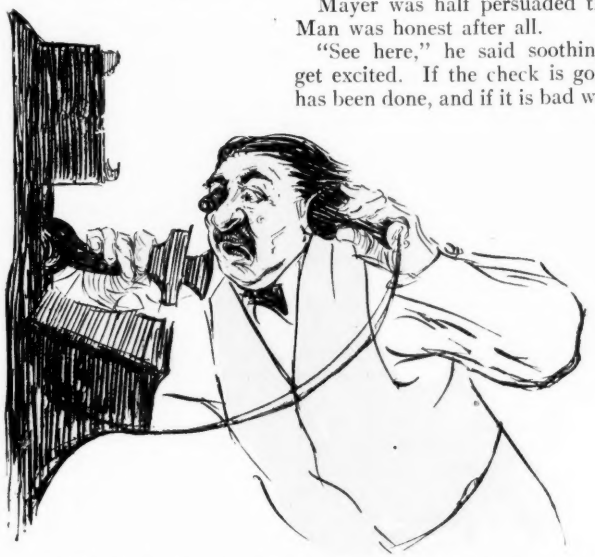
"What I want to know," put in Adolph, who was beginning to collect his wits again. "Is whether you still have those diamonds?"

Old Mr. Sigsbee looked a trifle indignant.

"Right there in the safe!" he replied, indicating it.

"Well," said Dolph, "I can't pretend to decide who is in the right about the check, but as I am to a certain extent responsible, I wish you would let me look at them."

"Certainly, if you wish," replied Mr. Sigsbee, and unlocking the safe he produced for Mayer's enraptured inspection the two earrings just as they had come into his possession the afternoon before. Mayer almost devoured them with his eyes searching for some sign of a substitution, but found none. No, they were the same diamonds fast enough. The thing seemed more a puzzle than ever. It was incredible that this Old Man was a thief and yet equally so that Whitman should have been mistaken.



"Yes," replied Oppenheim thickly, his heart stopping and the moisture gathering on his forehead

Dolph closed his fingers firmly over the little box that held the earrings. It is doubtful if two thousand dollars in eighteen karat gold could have led him to unclose them.

"I am very sorry, Mr. Sigsbee," said he, "that until this matter of the check is cleared up I shall have to retain the diamonds."

"You keep *the diamonds!*" cried Sigsbee. "What right have *you* to keep them. Didn't I pay for them? Aren't they mine? Give them back to me at once!"

"I'm very sorry—" began Dolph.

"Give them back to me or I'll call in the police!" ejaculated the old gentleman his mouth trembling with indignation.

"Come—that's pretty good!" retorted Dolph. "I guess if anybody calls in the police it will be me! How about the four hundred you got?"

Mr. Sigsbee turned purple with ineffective anger.

"Young man!" he cried, his voice shaking. "If I were ten years younger I'd thrash you within an inch of your life!"

Mayer was half persuaded that the Old Man was honest after all.

"See here," he said soothingly, "Don't get excited. If the check is good no harm has been done, and if it is bad why of course you'll have to give up the money and the earrings."

"But you are accusing me of forgery!" roared Mr. Sigsbee.

"I'm not accusing you of anything," replied Dolph. "Better get out your money and come over with me to the shop."

"Not much!" answered Sigsbee. "I'll go with you to the shop—but it will be just as I am."

In a sort of brain-storm, Dolph hurried downstairs with the Old Man at his heels. It was past nine o'clock, there were plenty of people on Main street and the stores were wide open. Half-way down the block Oppenheim burst from his store in a disheveled condition, and rushing up to Mr. Sigsbee seized him by the collar.

"You old rascal!" he shouted. "Where are those diamonds?"

Mr. Sigsbee wrenched himself free.

"Please keep your hands off me!"

Oppenheim shook his fist in his face.

"You give me back those diamonds or I'll take you to the lockup."

"Can't you control yourself, sir?" inquired Mr. Sigsbee, furiously. "You will have the whole town about our ears. Let us step into your store where we can discuss things quietly."

"It's all right," interjected Dolph who had been waiting for a chance to speak. "I've got the diamonds."

"Have you!" cried Oppenheim. "Let me see 'em!" He grabbed the box out of the clerk's hand and eagerly examined them. "By George! So you have! That's a good piece of work."

They had reached and entered the store by this time and now Oppenheim turned to the Old Man and barred the door.

"Now give me my money!" he shouted, wild with excitement.

"When you are able to conduct yourself like a gentleman I may be willing to talk to you," retorted Sigsbee, but Dolph thought he perceived an expression of uneasiness in the Old Man's face.

"Don't try and come that on me!" bellowed Oppenheim, dancing up and down with rage. "You're a thief and a forger. Why I met Whitman on the street and he said he hadn't signed a check to your order for over a year. But it isn't your name, either. I called up Mr. Sigsbee's house and the girl told me he hadn't ever been married. O, you're a fine one, you are! Wait until I get you behind the bars—"

"If you go on that way, you'll never get anything!" remarked the Old Man. "I'll make a trade with you. You keep your mouth shut and give me back the check, which I know is good—good, understand!—and I'll give you the four hundred dollars and the earrings."

Oppenheim's eyes glinted.

"Let's see the money!" he grunted shortly.

The other shook his head.

"It's over in my safe."

"You go with him, Dolph, and fetch it here!" ordered Oppenheim. It's a bargain," he said turning to the Old Man. "Give me the money and you can have your check."

"Mind you," said Sigsbee, "I'm doing this just to oblige. That check is as good as gold—and I'll cash it yet, see if I don't! But there's no use in being uneasy about it."

"By rights I ought to have you arrested this minute," growled Oppenheim. "Still of course I don't *know* that that check ain't good, and if you say it is I'll take your word for it."

"It's a perfectly legitimate transaction," commented Sigsbee. "We simply go back to where we stood before. You take your sparklers and the money and I get the check—which, I tell you again, is *perfectly good*."

"All right," said Oppenheim, his only thought being to make sure of the money as soon as possible. "Strictly speaking, I may be compounding a felony, but I guess it's excusable. What I want is my four hundred dollars, and I want it *quick!* When you hand Mayer the coin he'll hand you the check. Have you got it, Dolph?"

"Sure thing," answered the clerk, producing it from his pocket.

"Just endorse it back to me," said Sigsbee, handing Oppenheim a fountain pen from his waistcoat pocket.

The jeweler did so and gave the check back to Mayer.

"Now, hurry up, Dolph!" he exclaimed, "I want to see the money. And look sharp," he added to the clerk in a lower tone, "If he tries to duck, grab him and yell for a cop."

Sigsbee held out his hand.

"No hard feelin', is there?" he asked amiably.

"None under the circumstances," answered the jeweler with a grin, taking the hand. "But just between you and me a feller has to get up pretty early to take in Moses Oppenheim."

"I can see that," laughed the old gentleman over his shoulder as he followed Mayer out of the door.

It was with very different feelings from those he had experienced early in the morning that the clerk climbed the four flights to Sigsbee's office. The latter lost no time in opening the safe and handing Mayer the four hundred dollars, who promptly gave him the twenty-two hundred dollar check in return.

"Well, so long," said the old gentleman. "But that check is *all right*. Whitman's

dead wrong when he tells you he didn't sign it. Don't you ever forget that."

"Say, Dolph!" exclaimed Oppenheim on the clerk's return, "That *was* a narrow squeak! Have you counted the bills? Yes? Lucky you had the idea of going around to see Whitman! Only think if we had waited to put that check through in the usual way! We'd never have seen those earrings again—let alone the four hundred dollars!"

"I guess that's right," answered the clerk, and all that morning he whistled softly, "Rip Van Winkle was a lucky man!"

By mutual consent, they agreed to say nothing of the incident which both felt reflected no credit upon their sagacity.

But a week later, Mr. Whitman called Oppenheim up on the telephone.

"Say, Oppenheim," he remarked curtly, "Do you remember telling me that someone had tried to work off on you a bogus check bearing a forged signature of mine?

"Yes," replied Oppenheim thickly, his heart stopping and the moisture gathering on his forehead. "Why, has anything happened?"

"Nothing to speak of," answered Whitman, "Except that it was cashed at the First National Bank of Chicago four days ago and they paid it relying on the genuineness of the signature and endorsements. It has just come through for collection. Of course your endorsement isn't genuine, is it? You couldn't have endorsed a forged check after being told that it was forged?"

But the crash that came from Oppenheim's end of the line was a sufficient answer, even had the curse which accompanied it been inaudible.

Moses Oppenheim, in his shirt-sleeves, his hair tumbled and his little microscope still sticking in his right eye ran wildly up Main street to Merchants' Block and dashed breathlessly up the stairs to No. 41. But the door was closed and locked. It did not have even a name.

"What is it, Mr. Oppenheim?" asked the janitor as the jeweler dejectedly descended the stairs. "Did you want to see anyone?"

"O, I was looking for a man—up in 41," growled Moses sourly.

"Sigsbee—O, he moved out a week ago," replied the janitor. "Owed you something—maybe?"

"No," muttered Oppenheim, "I owe *him* one."

Poppy Seeds

By GRACE HIBBARD

O, you small sleepy things,
I've planted you out in the sun.
Down in the dark brown earth,
Sleep poppy-seeds everyone.

Dreams of beauty you'll rise
Joyously up to the light,
Petals ruffled around,
Soft, silken, red, pink and white.

Sleep, poppies, sleep on content,
Hid from the sunshine away,
Voices will call you to come,
South winds will kiss you some day.

New Science of Home-Making

By MAY L. CHENEY

Appointment Secretary, University of California

A NEW movement in education which has set the students of sociology thinking is the recognition of the two fundamental occupations of the human race, home-making and agriculture, as a proper part of the public school curriculum. The significance of the present demand that scientific methods be applied to these ancient occupations, which for so many years were left in the primitive stage of household lore, descending from father to son, from mother to daughter, can hardly be measured. That this change is the result of an impelling force stronger than inherited tradition, stronger even than the binding force of traditional pedagogy, who can doubt? Will it be strong enough to stem the tide of disintegrating forces which sometimes make modern scholars question whether Herbert Spencer was right when he said "the convictions which create and maintain the monogamic family have become innate in our modern civilization."

Changes which affect the material conditions of the home need not destroy its spiritual meaning, but the rapid shifting of our population from country life to city life, the need for enormous power of adaptation to meet the new conditions, the entirely new dangers which confront the present generation of home-makers may well make us tremble. Certainly there is food for thought in the records of our divorce courts, the reports of housing commissions, which show us the results of the crowding of many families under one roof, the possibility of the ethical bond being lost in the hurry of modern life. When families are held together merely for economic benefit, the mutual helpfulness and satisfaction due to mutual affection and responsibility for each other's well-being having vanished, one of the strongest factors in creating social righteousness is lost.

Mrs. Ellen H. Richards, of Boston, was one of the first women in this country to realize these dangers that threaten modern society. For forty years she has studied and taught the principles of right living, and her books and lectures have been an inspiration to many other workers in this field. In a lecture on "The Social Significance of the Home Economics Movement," delivered during the summer session of the University of California, last July, Mrs. Richards said that even before the study of sociology was talked of, careful observers of social conditions, noting the extravagance and ignorant mismanagement of American homes, started cooking schools for adults in Boston. They recognized the principle that food is the fundamental race factor, and satisfaction with it is essential to well-being. The ethical value of the home table, which brings old and young together, the loving care which favors individual tastes and contributes a spiritual essence to the commonest food, may have much to do with that sense of satisfaction. "Home" cooking has a value of its own that the hotel and restaurant cannot supply. Mrs. Richards spoke of the famous New England kitchen, which was the fruit of an effort to save the workingman from the temptation to drink by helping him to

a good noonday, meal, and teaching his wife to prepare sustaining food.

These efforts to reach the adult man and his wife were disappointing in their results, and now attention is being concentrated on the luncheon of schoolchildren. The remark of an adult laborer: "I'd ruther eat what I'd ruther, and not what's good for me," illustrates the rather discouraging attitude of a people known around the world as a race of dyspeptics. Unless home is to become a mere boarding-house, organized industry having robbed it of the varied occupations which formerly trained the children not only in manual dexterity but in moral responsibility, the school must come to the rescue, and prepare the next generation of parents to meet the new conditions which threaten to rob us of the most precious fruit of an age-long moral struggle, the monogamic family.

When we compare the primitive housekeeping of our grandmothers with the housekeeping of the near future, we see why we must have schools of domestic science, along with schools of agriculture and commerce. A spring of pure water and a piece of land capable of cultivation were all that the home-makers of that generation needed. How different is the problem that confronts the modern housekeeper, penned in a city flat or apartment. She has need of training in half a dozen sciences to enable her to choose a habitation for her family. She must know something of sanitary science. How otherwise can she make sure that the land on which the house is built has been properly drained, that the building itself is provided with all possible appliances for guarding its inmates against the deadly sewer-gas, or that its air supply in not sent through ventilating shafts that suck up stagnant, unclean air from dark cellars, or that it has not been vitiated by the poison from leaking gas pipes and heaters. How can she know that it is properly cleaned, and the garbage really disposed of, and not carried a few blocks away, and dumped on the ground, to become a breeding place for flies that may carry disease to a whole city? How can she know that the water which is brought from reservoirs many miles away has escaped all of the possibilities of contamination on its long journey to her kitchen tap? Bacteria were unheard of in her grandmother's day. The clean air of the prairie was not in need of straining to make it safe to breathe, as is the case with much of the air in our cities. The refuse of many families had not entered her spring. She did not have the constant fear of ptomaine poison lurking in tinned meats, or of other dangers almost as deadly which over-ripe fruit or much-handled vegetables exposed in open markets now bring into the home.

We live in an engineering age. Mrs. Richards calls attention to the fact that a nation can no more afford to let its citizens waste their resources of health, bodily energy, time and brain power, than it can wantonly destroy its natural resources. Household engineering is the great need at present, and social engineering for moral and ethical well-being. We are teaching domestic science in the elementary schools and home economics in the universities in order to teach the people to control their environment.

The University of California took an important step last April when it agreed to give entrance credits in domestic science. The short paragraph which deals with the subject in the announcement of matriculation requirements, states that credit will not be given for domestic science, without credit for elementary chemistry, and that credit for studies in household decoration and furnishing will be given in connection with free-hand drawing. Besides cooking, sewing and laundering, hygiene, dietetics, home economics and nursing are mentioned under domestic science. With the recognition of these subjects as a proper part of a high school curriculum, has come a demand for a sequence of courses at the University which will fit graduates to teach domestic arts and sciences in the secondary schools, and incidentally fit women for a number of new professions, as well as for the oldest of all, the profession of housewife.

A committee of the University Faculty has been appointed by President Wheeler, to outline the new courses. Dr. Jessica Peixotto, of the Department of Economics, is chairman of this committee, Professor C. G. Hyde, of the Department of Sanitary Engineering, is the secretary, and the third member is Professor M. E. Jaffa, United States pure food expert, and professor of nutrition at the University. Inquiry developed the fact that there are a number of courses now given at the University which, with slight modification, will form an

excellent foundation for these new lines of work. Those who intend to follow them are advised to get a good foundation in laboratory science, especially chemistry, as this is necessary for the sanitary inspector, the laboratory assistant or science worker in nutrition textiles, hygiene and nursing, as well as for the teacher of domestic science. There are courses in economic botany, which give the fiber work leading up to more special instruction about textiles, courses in the biological examination of water, and in bacteriology and sanitary chemistry which prepare the way for Professor Hyde's courses on sewage and sewage disposal, water purification and sanitation. There are courses in the Department of Architecture which are invaluable to those who intend to study design, household decoration, or landscape gardening, and courses in agriculture, such as dairy chemistry, household entomology and the valuable courses in nutrition, which are indispensable to the student of domestic science. The study of economics is equally important to the housewife. Dr. Peixotto gives a course called "The Household as an Economic Agent," in which she discusses the economics of spending. She requires her students to make a budget for a family of moderate income, and calls attention to the fact that women spend the money of the world, and do it without sufficient thought and training. A course in the "Principles of Economics," is prerequisite to this.

It is interesting to note that the original meaning of economics is household administration, domestic management. Perhaps because the household was the cradle of all of the industries, and had so much to do with the production of wealth, as well as its consumption, the word economics has now come to cover the broad field of the study of the growth of wealth and what man does with the products of his industry. Women have been slow to realize that this new science, and especially the economics of consumption was a study of special importance to them. When spinning and weaving and dyeing were carried on in each home, women knew what the quaility of the cloth was and whether the colors were fast. Now they go to the store and without expert knowledge and the judgment which can come only from experience they fail to detect the countless imitations of wool and linen with which the manufacturer floods the market. Worse still they buy adulterated and damaged food, unless careful study has taught them how to guard against the lure of the bargain counter, and clever exploitation by paid advertising agents, which is such a dangerous feature of our modern system of competition.

Another result of the organization of industry, and the substitution of the factory for the separate manufacture of each family's food supply, clothing, and other necessaries, is the need of watchfulness lest the conditions under which they are now produced prove a source of danger, not only to the workers but to the consumer. Consumers' Leagues are being formed all over the country, and their investigations have already shown how intimate is the relation between our own well-being and that of the unknown toilers who furnish our tables with dainties and our bodies with comfortable garments. Just as the detached home, dependent upon itself, has given way to the home in a corner of a caravansary, and that change has brought about a thousand new responsibilities, so the steady march of co-operative manufacture of all of the articles of daily use demands of the housewife ever wider and wider views of her personal responsibility. Fuller knowledge brings a keen sense of the utter dependence of one member of society on every other, in a world where steam and electricity have annihilated space. There is no possibility of safety now except in the safety of all. Conditions which produce disease in the underpaid worker in a New York sweat-shop threaten the health of the far-away home to which the product of her labor is carried. We connive at the sacrifice of the youth and health of the child laborer of the South, when the San Francisco merchant offers its product at a bargain which we cannot resist. Women who are not shirks will face this new responsibility. We call the new course at the University "Domestic Economy," or "Home Economics," to distinguish it from the larger study of the housekeeping of the nation, but it has this great advantage that the women who follow it must catch a glimpse of this larger field. It may set them thinking about the reason why domestic service in the old sense of the word is obsolete, why we need a new race of women who are competent to manage their own

homes, or to work out a system of hired service that is not prohibitive in price, while it is exasperatingly incompetent.

Thus far the unusual interest which has been manifested in the new course in "Domestic Economy" may be due to the fact that there is a great demand for teachers of the subject, but it all works to the same end. Miss Ednah A. Rich, who has recently been appointed President of the new State Normal School of Home Economics and Manual Arts at Santa Barbara, was able to tell the Governor that no girl graduates from the Santa Barbara grammar schools who cannot cook a wholesome meal and make her own clothes, and no boy graduates who cannot earn his living as an apprentice. Miss Rich foresees that all of the schools of California will soon demand the same kind of training, with a study of the broader facts behind these technical branches in the secondary schools. When all of these schools co-operate with the University, we shall be ready to teach household engineering as the Twentieth Century demands it, looking forward to the time when electricity, which now runs the sewing-machine and cleans the carpets, will heat the house and do the cooking. The more labor-saving devices and machines there are, the greater the need of scientific training. Who shall say that it was blind social evolution which caused women to demand a training from the schools which would fit them for the responsibilities of a world so new and so different from the old that the training that sufficed for their mothers could not save them from disaster?

Planting a Tree

By Alfred Kummer

What does he plant who plants a tree?
A scion full of potency;
He plants his faith, a prophecy
Of bloom and fruitfulness to be;
He plants a shade where robins sing,
Where orioles their nestlings swing;
A burning bush—a miracle!
Who plants a tree, he doeth well.

What does he plant who plants a tree?
He sets a strong mast for the sea;
He makes the earth productive, fair;
He helps the vines climb high in air,
And from their censers shed perfume
To sweeten night and bless high noon.
Against the vandals who despoil
He sets his protest in the soil.

What does he plant who plants a tree?
An emblem of the men to be,
Who lightly touch terrestrial clay,
But, far above the earth, away
From sordid things and all things base,
Lift high ideals for their race.
Who plants a tree, he doeth well,
Performs, with God, a miracle!

Horace Fletcher's Philosophy

By MICHAEL WILLIAMS

Author of NEW AMERICA; *Co-Author with Upton Sinclair of* GOOD HEALTH, *Etc.*

THERE is an old saying that runs to the effect that some men are born great, and some men have greatness thrust upon them, while other men achieve it. Sometimes they achieve it by singular methods. Ambrose Bierce once wrote of Chauncey M. Depew that he was a man who ate his way to eminence:

> Eater and orator, the whole world round
> For feats of tongue and tooth alike renowned.

Of Horace Fletcher it might be said that he has chewed his way to greatness. Eater—but after his own method! and philosopher, rather than orator, the whole world round he is renowned for feats of pen and tooth. Here the parallel stops, however; for while the fame which Mr. Depew won through oratory and gastronomy is not likely to be permanent, there is no doubt that chewing has brought a very durable and very real kind of eminence to Horace Fletcher, the former San Francisco merchant and athlete, sometime president of the Olympic Club, who to-day is regarded as a chief leader of the great world-wide movement toward the simplification of dietary customs and habits.

It is not the purpose of this article, however, to deal with Mr. Fletcher's dietary habits, but rather to give some account of the philosophy of which his dietary rules form but a part. There is perhaps no man before the public to-day—always excepting the African Hunter, of course—of whom so much is written as Horace Fletcher, nevertheless, the story of how he formulated his philosophical system has never been told until now.

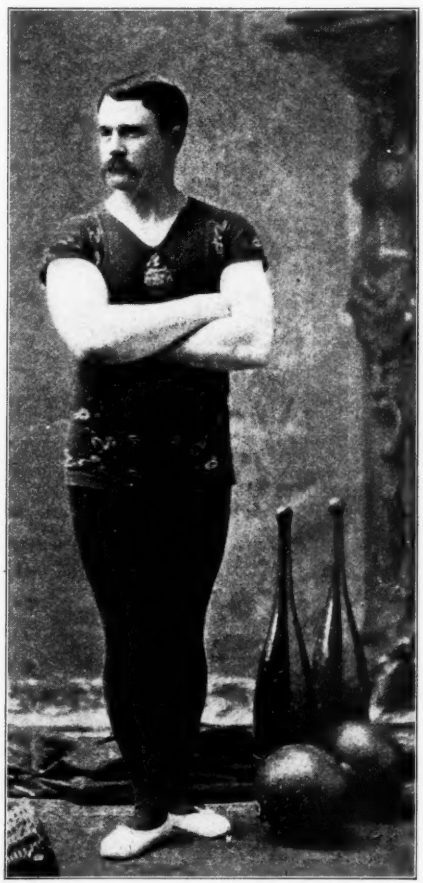
But please don't be alarmed! "Fletcherism," as a philosophy, is not at all akin to the brands of "highbrow" thinking which are usually regarded as philosophy; it is not at all like Hegelianism, or Berkeleyism, or Kantism, on the contrary, its main quality consists in its great simplicity, and its very practical, every-day-kind of utility. "A philosophy," says Professor William James, "is the expression of a man's intimate character." There is no more singularly interesting personage on the public stage to-day than Horace Fletcher, and the intimate character of the man which is expressed in his philosophy is one that has proved to be one of the widest popular appeal.

When William James resigned after thirty years of service his post in Harvard University and stepped out into the more dusty arena of the larger world in order to devote himself to the popularization of his philosophical ideas, he caught the attention of the thinking world with his now famous article on "The Powers of Men." In this article he made the following statement:

> We are just now witnessing a very copious unlocking of energies by ideas, in the persons of those converts to "New Thought," "Christian Science," "Metaphysical, Healing," or other forms of spiritual philosophy who are so numerous among us to-day. The ideas here are healthy-minded and optimistic; and it is quite obvious that a wave of religious

activity, analogous in some respects to the spread of early Christianity, Buddhism, and Mohammedanism is passing over our American world. The common feature of these optimistic faiths is that they all tend to the suppression of what Mr. Horace Fletcher calls "fear thought." Fear thought he defines as the "self-suggestion of inferiority," so that one may say that these systems all operate by the suggestion of power.

In this article Professor James gave us the results of many years of thinking on the "phenomenon of second wind"—or the manner in which the men and women who can find the magic keys open up reserve sources of physical or mental energy when seemingly they have reached the end of effective effort in any given direction—when they have "reached the end of their rope," in other words, and are "tired out." If it chances, however, that these tired-out persons push on instead of giving up, then, says Professor James, "a surprising thing occurs. The fatigue gets worse up to a certain critical point, when gradually or suddenly it passes away, and we are fresher than before. We have evidently tapped a level of new energy, masked until then by the fatigue—obstacle usually obeyed. There may be layer after layer of this experience. A third and a fourth 'wind' may supervene. Mental activity shows the phenomenon as well as physical, and in exceptional cases we may find, beyond the very extremity of fatigue-distress, amounts of ease and power that we never dreamed ourselves to own, sources of strength habitually not taxed at all, because habitually we never push through the obstructions, never pass those early critical points."



Mr. Fletcher when President of the Olympic Club, San Francisco, 1878

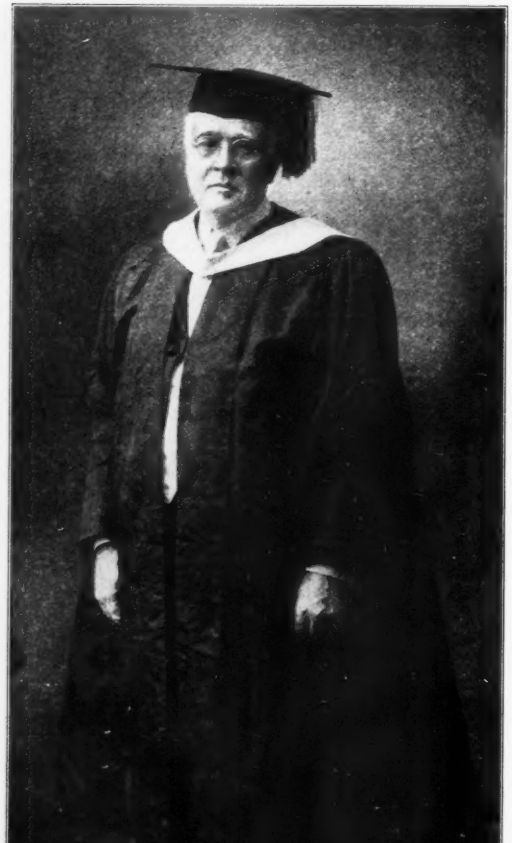
It is possible that no living person furnishes more striking proof of the truth of Professor James' inspiring thesis than Mr. Fletcher, whom he names as the definer of the fundamental quality of the energy-producing optimistic faiths of to-day.

Born in Lawrence, Massachusetts, fifty-eight years ago, Horace Fletcher first began his adventurous career when he was twelve years of age, by attempting to run away to join the Navy. He was captured and restrained by parental authority, however; but when he was fifteen he succeeded in embarking on the whaling craft, the *Matthew Luce*, which had been sold to the Japanese. After reaching Japan, he was transferred to another whaler, the old *Pembroke*, which figured in the Siminosecky affair—an event that disturbed diplomacy forty or more years ago, the ship being fired upon by the Japanese as she was trying to enter the famous Inland Sea. This was but the first of numerous visits which Mr. Fletcher has made to Japan, from whence he derives a good deal of his philosophy.

After many years of trading, traveling and various adventures in the land of the rising sun, and among the various islands of the Pacific, Mr. Fletcher came to California, where he originated the famous Ichi-Ban establishment of San Francisco, one of the richest, and the pioneer of all Oriental art stores in the United States. He was also a pioneer patron of amateur

athletics in the United States, being a prominent member of the Olympic Club of San Francisco, of which he was president for several years. As a competing athlete and gymnast in amateur competitions, Mr. Fletcher won many medals. He organized a company of the National Guard in San Francisco, made up exclusively of athletes, which saw service at the time of the Sand Lot riots.

By the time he was thirty-five years old, Mr. Fletcher had accumulated a large fortune, and he retired from business to devote himself to art. Going to Europe, he studied with some of the best-known painters of the day, producing works which were exhibited at Munich and in the Paris Salon. He did not care to follow art professionally, only for its own sake. But his thoughts were turned more and more away from the satisfactions of successful business, of hunting and fishing and club life, and also from the deeper pleasures of art, to the wider and profounder joys which, he avers, he finds in his philosophy—a philosophy which may be expressed in one word—optimism. This is the key which opened for him reserves of energy and of power at a time when it seemed that all energy and power were exhausted, that the reservoirs were drained, and that death was beckoning. He had reached the age of forty-five, when it appeared likely that the only further use to which his philosophy could be put would be to ease his downward path to the grave. This was at the time when he was awakening to the deepest and highest pleasures of life—and life was slipping away from him like a dream. He was afflicted with several ailments which were pronounced incurable by his physicians. He was refused life insurance. He was immensely obese. In his own words, he seemed to be "a thing fit but to be thrown upon the scrap-heap." Mr. Fletcher possessed, however, a splendid fighting weapon in his will. He determined that he would not yield himself to the dark angel of death that had obtruded into the sunshine of his new life. He determined to overcome this specter if such a thing was possible. Having wealth at his command, he tried all available medical means to overcome physical disabilities which threatened the further



Dartmouth College last year conferred on Mr. Fletcher the degree of Master of Arts

enjoyment of his philosophy, but they all failed. Then came his great discovery, or rather re-discovery—of the simple method of eating and drinking which is now everywhere known as "Fletcherism"—although complete chewing is but one of the two main wards of the key wherewith he unlocked his reserve of energy. His discovery saved his life, and transformed him from the invalid that he was to a man whose strength and endurance have amazed even the trainers of athletes.

And now let Mr. Fletcher himself relate how he discovered his key, and just what this key of his is. He told me the story in a room in the Waldorf-Astoria, New York, with Professor James' article in his hands. (Mr. Fletcher stays at the Waldorf-Astoria and hotels of a similar class for the purpose of showing how his key makes it possible to live in such luxurious quarters at a slight expense. He avers he can live, even in such sumptuous hostelries, at a cost for food of not more than a dollar a day—minus tips!)

"Before I say anything else let me remark that I am bubbling over with enthusiasm aroused by these extraordinarily inspiring utterances of Professor James," said Mr. Fletcher. "Here, certainly is a splendid example of the great team work in optimistic effort which marks our present age. For a number of years Professor James has been perhaps the greatest living coach in psychological team work, and now after he has sprinted briskly by the threescore years and ten post of life, he has jumped into the game as a center rush—fortified and equipped with the energy which has grown up within him from his optimistic philosophy.

"He is quite right in what he says, that, as a rule, men habitually use only a small part of the powers which they actually possess and which they might use under appropriate conditions.

"Most people stop short at the first obstruction they encounter, when engaged in any work that taxes their energies. A great many drop completely out of the running with the shortening of their first wind. Did these people realize it, they have but encountered the first real test of their innate fitness; the first examination as to their strength or their weakness to which they are called by the Life Force. And very often it happens that this very first test is most momentous; it may be a supreme event, it may be the crisis of their lives. All the factors that go to influence their destinies may at this moment be trembling in the balance. The weight of a single thought may incline the scales one way or another, towards a fuller, an ampler, and a nobler area of life, or towards an untimely and lamentable defeat. Do we not all know sad souls, for instance, who at the very first suggestion that they have tuberculosis, abandon all hope, yield themselves up unto fear, and literally—in the stark meaning of the words—*think* themselves into their graves, whereas, if they had but sparred for their second wind, in the Jamesian sense of the phrase no one need die before nature brings the goodly gift of natural death.

"Many of my critics say that I am naturally of a placid disposition, temperamentally cheerful, a born Mark Tapley, my close friends all call me Buddha, and they say that it is easy for me to take a sunny view of the world. Yet I am an instance of a man who acquired optimism, who deliberately set out to obtain it, and who had to struggle against many obstacles while engaged in his quest for optimum happiness. I was for a great many years as much inclined to worry and mentally nag myself as any dyspeptic business man. I was once a person who thought that health and disease, misery and happiness, were all pretty much matters of chance, haphazard-happenings like dice-throwing in the game of life—with the dice loaded at times. Disease and pains, it seemed to me, were afflictions, perhaps punishments for sins (our own or our progenitors), but they were scattered among the children of men in the most casual way imaginable.

"Then there came my great awakening—my conversion or illumination, shall I say? To all men there comes, sometime or other, the moment when they hear a voice like the voice that Paul heard on the road to Damascus. That moment of revelation came to me in Boston, on the road between the Parker House, where I was staying, and the house where a friend of mine was living. It had been my privilege that evening to be with Professor Ernest Fenellosa, in his Japanesque apartment in Boston. There we had sat surrounded by works of the exquisite art of Japan; works done in bronze, in ivory, in silk, ebony, silver—

Mr. Fletcher as he appears to-day

works almost everyone of which had been presented to Fenellosa by some artist friend. The odor of incense added to the calming influence of the environment. We had met many years ago in far off Japan, amid similar surroundings, and had discussed theories of true living that had been a source of great pleasure to me, and whose influence had been with me to many countries and climes, helping me to enjoy more fully than I otherwise could the beauties of nature, of art, and of life. And now my friend told me of the great benefits obtained by following the Buddhistic code of discipline.

"It was all so interesting and beautiful, that under the spell of the recital and the surroundings I longed to taste some of the sweets of the calm he pictured, and begged him to tell me the process of the discipline so that, perchance, I might follow it and reap some of the benefit. The philosopher saw that I was serious in my desire, and then his face lit up with approval as he said:

'It is not easy to indicate at a sitting what took me years of study to learn, but I can at least put you in the way of a start. *You must first get rid of anger and worry.*' 'But,' said I, 'is that possible?' 'Yes,' replied he, 'it is possible to the Japanese, and it ought to be possible to us all.'

"I was startled at the suggestion of the possibility of the entire repression of anger and worry. I knew that their repression was counseled by Christianity and Buddhism and presumably by many other codes of religion and ethics, but I had never considered getting rid of them a human possibility, except under conditions of health and wealth and ease to which few if any ever attain.

"On my way back to the Parker House, a distance of fully two miles, I could not think of anything else but the words, 'Get rid, get rid.' I was strangely and deeply impressed by them, and the idea must have continued to possess me during my sleeping hours, for the first consciousness in the morning brought back the same thought with the revelation of a discovery.

"If it is possible to get rid of an anger and worry, was it necessary to have them at all? This was the question which came to me. I felt the strength of the argument. I at once accepted the reasoning. The baby had discovered that it could walk. It would consent to creep no longer. (And let me remark in passing, that the Buddhistic discipline also forbids gluttony along with anger and worry, and thus it is in accord with the physical side of my method of life as well as with the mental. But when you come to study the question deeper, one sees that both are basic principles of primitive Christianity.)

"From that time to this, I have known that everything that happened to me was my own fault, or my own reward. The key to power, to success, to happiness, had been put into my hands. I knew that nature intended me to be strong, healthy, and fearless. Fearlessness is merely an application of available intelligence, written everywhere in nature, to be read by anyone who has the key to nature's beneficent intentions.

"I soon realized the fact that the fear of death was the underlying fear of all fears. I concentrated on that—on the removal of the fear of death. Steady contemplation of a phantom is all that is necessary to banish it—we see there is no ghost there at all. It may return, but again it may be banished, and each successive banishment lends new strength to the power of the will-to-be-fearless. One cannot conquer fear, for always there are events happening which threaten us with fear, but one can always defeat fear. I am engaged in a finish fight with fear, in which I am having the better of every round, and in which victory will be mine at the end of all.

"By giving special attention to the fear of death, it became evident to me that by merely allowing yourself to go with the current of natural evolution, you come upon the truth that death can only mean promotion; that it is a step higher up, a movement forward. In the natural course of things, death at the right moment of life is a natural death; the right moment in time being in natural old age, when the long rest is looked forward to only with pleasure. Old age, I saw, was intended by nature to be the crown, the real end of earthly life; for in a natural old age, as Elie Metchnikoff points out, an instinct of death will be evolved. The feeling will spontaneously come within us that now after a long and sunny day, the bland soft dusk is welcome.

"Thus I rid myself of all fear of death; I rid myself of the causes of death, save the remote causes of accidental death; I am fifty-nine years old and in all probability will go on living, barring accidents, for a number of years yet ere the instinct of natural death will arise to tell me that the hour of my next promotion in the scale of being is at hand.

"As I progressed on this wide way of life, I found that some people who seemed to have no fear of death because their religious faith bulwarked them against it, were yet very much afraid of pain. So I concentrated on the killing of the pain of fearing pain. I found abundant evidence to prove that actual pain was not unbearable, and that even in the midst of what was considered to be the most excruciating agony the mind of the sufferer could be diverted, and he would forget pain as long as the diversion lasted.

"The reality of my conquest of the fear of pain was tested not long ago in a place which is dreaded by so many—namely, the dentist's chair. I sat on one occasion for twelve hours at a stretch. During four of

these hours. I sat with my mouth pried open and held open while the most painful kind of dentistry was in progress (of course there was no necessity for such a severe siege—I did it as a test). I found that I could fix my thoughts on any subject I cared to select and remove them entirely away from the contemplation of pain. And I was not conscious of the pain while I thus employed my mind elsewhere. I did not *mind* the pain, in other words; and that common saying of not 'minding' anything is packed full of a deep meaning. I never miss an opportunity to side-track the feeling of pain when it menaces. I am sure that ninety-nine one hundredths of the so called pain suffered by mankind is the fear of more pain, the fear of pain to come, and is not the actual pain of the moment.

"In noting the inspiring causes for my optimism, I must give first place to the example of my father and mother. In the business of life my father seemed to be happiest, or at least the most energetic, in the presence of obstacles. And while the business of life was made smooth and easy for my mother by this unfailing hopefulness of my father, she, too, spent the whole of her life to the Biblical limit of threescore years and ten in unremitting interest in life. She was past the age of forty when she acquired French. She was more than fifty when she learned Italian, German and shorthand. She was past sixty when she took to flower-painting, displaying as much interest as anyone of her intimates in the same class who were most of them thirty years her junior, and she made as good progress as the ordinary amateur. When she was past seventy years of age I have seen her give up her seat to a seemingly older woman who was in fact only fifty, and insist upon the acceptance of it."

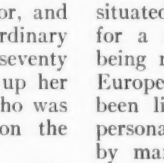
Such is his own account of the origin and progress of the philosophy which has proved itself of practical value to hundreds of thousands of people.

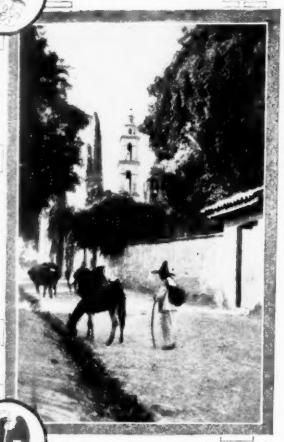
William Greer Harrison, who succeeded Mr. Fletcher in the presidency of the Olympic Club of San Francisco has told me that in his opinion this philosophy is no acquired thing, but a natural and spontaneous product of nature and temperament.

"I knew Horace Fletcher very well in the old days," said Mr. Harrison. "Back in 1878 he was president of the Olympic Club, and a very fine athlete himself; or perhaps I should say a very fine gymnast. Physically he was, as he is to-day, immensely strong. He was especially good in tumbling and horizontal-bar feats, and with Indian clubs. He and Ben Bogner and John Hammersmith made up a capital team for comedy stunts, to amuse the Club's guests on show days.

"He was a deservedly popular man, very highly esteemed in San Francisco. Even in those far off days, he was much interested in philosophical questions. He was pronouncedly a foe to worry of all sorts, and it seems to me that now he has but worked out systematically and theoretically ideas and beliefs that were always his own, instinctively and practically."

After leaving San Francisco, Mr. Fletcher went, about 1882, to New Orleans, and since that time has passed a great deal of his time in traveling about the world. His home is in Venice, where he occupies the Palazzo Saibante on the Grand Canal. He says Venice is merely a suburb to New York—for him; also the most conveniently situated residence place in all the world for a man who wishes to travel much, being not far from all the great cities of Europe. For sometime recently he has been living in the slums of New York, personally directing a movement supported by many prominent people to teach his methods of dietary reform to the poor people, especially to children.





Mexico As It Is

By GASPAR ESTRADA GONZALES

SECOND PAPER

TRANSLATED FOR SUNSET MAGAZINE

THE four years between December, 1880, and December, 1884, should have been for Mexico, the happiest in all its past history. The great development of its best materials, an increase unequaled in public rents, a larger increase in commercial transactions, the merging of strong foreign capital, and the conservation of peace, should have given as results, a balance highly favorable to the progress and credit of the republic. Instead of this, that administration bequeathed to its successor the most complete financial disaster, bad credit, and the menace of an imminent and grave upsetting of peace.

In the midst of all this disorder and threatening ruin, Mexico turned its eyes again to General Diaz, and confided to him once more her destiny. From that epoch, and by reason of the country's resolving not to place the government in hands less expert, President Diaz has ruled during more than twenty-five years. He has governed with the approbation of the people, and has been unable, notwithstanding his desire to give up the control, compelled by the entire nation, who wished to make his power perpetual, that its own prosperity and peace which it has enjoyed through his wise government, might be continued.

Upon taking up his high responsibilities in December, 1884, the fiscal situation was, as said before, lamentable. As Diaz himself describes it in his report issued in December, 1888, referring to the acts of his second administration:

"The condition of the Treasury is a matter of such importance that without it the regular course of the public administration cannot be conceived. The grave difficulties that confronted the executive upon this point at the inauguration of its constitutional period, and also by the efforts made to introduce order in such an important branch, and to re-establish the credit of the nation, can easily be understood, as follows:

"The executive debts on the part of the government on the first of December, 1884, in favor of the 'Banco Nacional,' the banks of 'Londres,' 'Hipotecario,' and 'Monte de Piedad,' amounted to $10,751,015.95. For the security of this amount, according to their respective contracts, as also by the indebtedness to railroad companies for subventions, and for the sum of $4,533,862.68 value of the bonds issued to private

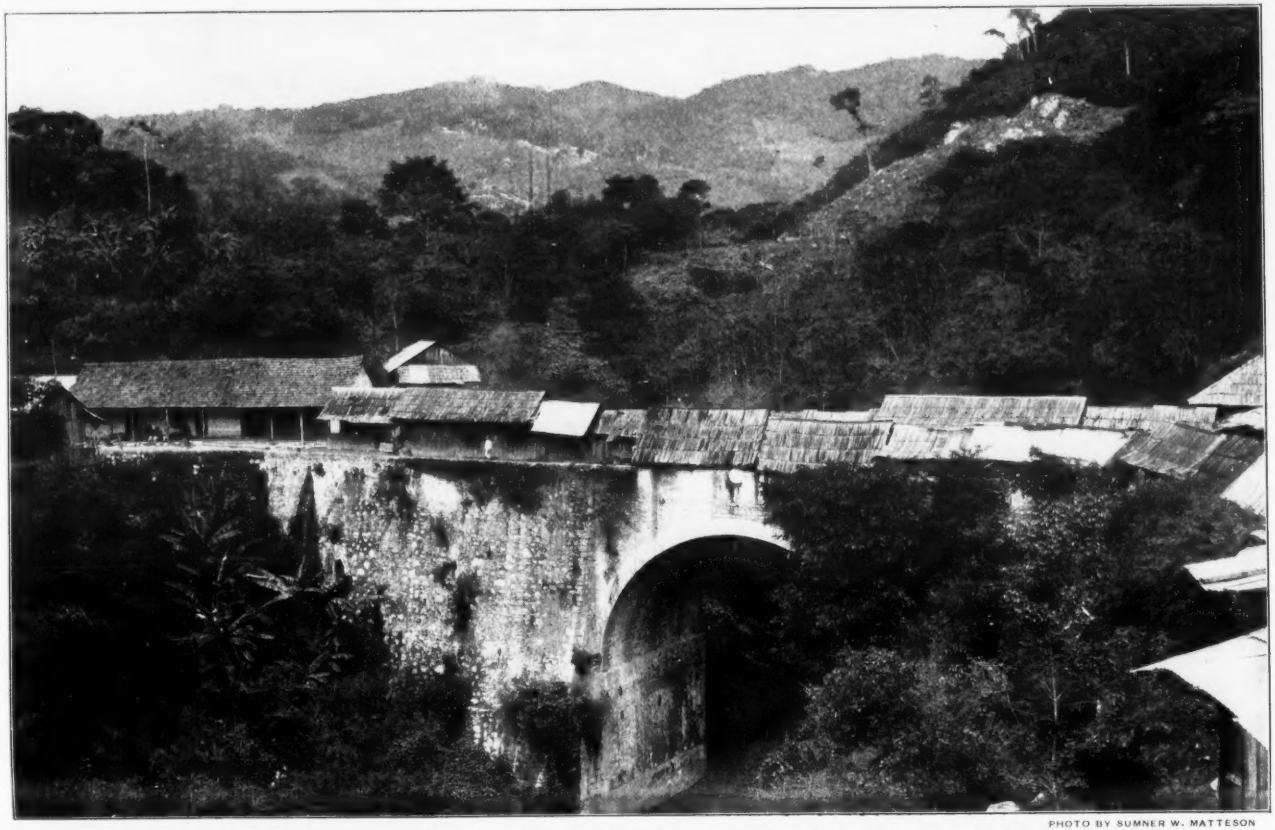


PHOTO BY SUMNER W. MATTESON

Village on a bridge over the Atoyac river, in Mexico, in the region of coffee and bananas, 3,000 feet above the sea. Further up the river, American capital has built a modern sugar-mill

parties, the custom-house revenues were compromised to such an extent that only about twelve per cent could be disposed of amongst those that were less burdened, in consequence of which there remained but little to pay the salaries of the clerks and the expenses of the same custom-houses.

"Consigned also to the 'Banco Nacional,' according to Article II, of the decree of May 31, 1884, was the revenue of the direct taxes of the federal district, which forms one of the largest revenues, but although the loan authorized by said decree did not materialize, in view of its contract of same date, conforming to which the government advanced $4,000,000, this institution was to receive the revenues referred to—applying a certain part as payment of rents, and another to the amortization of the capital.

"As a result of these engagements the government found itself in the absolute impossibility of meeting a budget of nearly $26,000,000, without counting the authorizations contained in the same budget and the expenses voted for afterwards, which amounted to many millions."

In addition to the fiscal ruin, Diaz found himself surrounded by great public discontent which, without a doubt, would have caused a general upsetting if the people had not rested all their hopes in him—confident that on returning to power, he would know how to remedy the ills, and place the country upon the road of progress. That discontent had broken out in the capital in disorders which resulted almost in riots, when, in the Chamber of Deputies, was discussed the contract stipulated by the administration of General Gonzalez with the representatives of the foreign creditors of Mexico. The unpopularity of the Gonzalez government made the contract unpopular, and being received inside and outside of parliament with protests and disorder, failed completely.

This circumstance appeared to close all the doors to the new government of Diaz. For want of ready funds, and facing important engagements, with the interior credit exhausted—having been abused and badly employed by the former administration—Diaz had no other recourse at hand than foreign credit, but to obtain it, it was necessary to recognize the foreign debt, make arrangements with the holders of bonds, and give them assurances of the fulfilment of the engagements contracted with them—and all this had been rejected by the chamber and was opposed by public opinion in an aggressive and tumultuous manner. General Diaz found himself in a peculiar circle. To bring back to the country peace and prosperity, it was indispensable to recognize the foreign debt, and this way obtaining foreign credit, but it was exactly this same recognition which was repudiated by parliament and public opinion, and without which the credit was impossible.

Facing such a grave situation Diaz resolved upon a bold stroke—one of rashness, almost equal to those that had brought him so many victories as a soldier. Braving all the dangers, jeopardizing his immense popularity, exposing himself to the possibility of the nation rising against him, he recognized the debt in his memorable message of June 22, 1885, using the power that the chambers had given to the executive since the previous administration.

This bold stroke produced soon a feeling of confidence. Even the local creditors whose payments had been suspended not only agreed to wait and accepted considerable reductions in the assignments of the principal public revenues which had been given them by the Gonzalez government, but they also consented to facilitate new sums of moneys for the most urgent necessities of public service; and shortly after, high foreign financiers offered to loan to the new government, large sums of money, which would enable it to continue for several years its work of material progress, and gave to the public treasury of Mexico, a sustainable and decorous position which was transformed later into a most accredited and brilliant one.

As we intend to dedicate a special article to the financial administration of Diaz, we will not enter upon further details for the present. It suffices to say that the prosecution of the material progress was continued until 1895, due to the facilities of credit obtained by the government, and which permitted it to attend to its own and public necessities, and to fill up the heretofore inevitable deficit in the budget. Since 1895, the Mexican treasury has sufficed itself and accumulated considerable surplus and reserves for possible emergencies.

The railroad progress of Mexico, between the years 1884 and 1909, the period during which President Diaz has governed without

Village on a bridge over the Atoyac river, in Mexico, in the region of Orizaba. Bridge has also art above the cast [illegible] has built a modern sugar mill

interruption is shown by these figures of kilometers in actual operation:

Years: 1888, 7,836; 1892, 11,291; 1896, 12,151; 1900, 14,773; 1909 (September) 24,161.

This last figure covers not only the railroads of Federal concession but also includes 4,840 kilometers of government road. The extension of the railroad system has placed the capital in connection with all the principal states and seaports.

All the metalliferous zone of the central part of Mexico and the different centers producing hennequin, and tropical fruits, have railroad lines which permit quick circulation of merchandise, and can be easily found when offered or demanded, and in the best reciprocal conditions. Towns before separated by immense distances and at times deserted, to-day join hands and are learning to know and esteem each other, and the spirit of provincialism —mortal enemy of the unity of races and source of perpetual anarchy—is now transformed into higher and nobler sentiments of national solidity. The action of public power, before so latent and so precarious in preserving order and making effective individual guarantees, is to-day rapid and sure. The rural towns as well as the more important ones in the Federal district which once took no interest in the Federal Government, see now at every step its action, indefatiguable and active for the public welfare, and have accustomed themselves to consider it, not as an obstacle to the progress of their interests, but as an efficacious auxiliary to its betterment, an essential spoke in the wheel of the united political mechanism.

At the same time the Mexican people have developed a love for peace, respect for the institutions and authorities, and an unextinguishable thirst for progress which augurs much good for the future.

We here call the attention to the Tehuantepec Railroad, inaugurated a short time ago, an interoceanic route of commerce of immense importance through which circulates merchandise proceeding from the Orient and the Gulf States.

The Southern Pacific lines now extend far beyond Mazatlan, and will reach Guadalajara by 1912.

As a natural consequence of this development of the railroad system has come the increase in passengers, freight and revenue as shown by the following figures:

RAILROAD MOVEMENT OF MEXICO

Years	Number of Passengers	Freight Tons	Value of Products
1876.....	4,281,327	132,915	$ 2,564,870
1884.....	13,346,485	1,025,569	11,089,136
1908.....	97,514,850	12,543,969	76,389,513

The Mexican postal service offers a showing no less surprising. With the wisely framed postal legislation and Mexico having joined the Universal Postal Union, its mail service is all that could be desired.

The following figures are for the fiscal years 1908-1909:

Extension of kilometers of postal routes	117,065
Number of kilometers covered by mails	41,528,795
Number of local and temporary post-offices	2,964
Number of matter of all classes which circulated during that period	191,768,042
Total revenue for said year	$ 4,313,747.03
Number of local and international money orders	1,563,795
Value	$54,899,520.40
Number of parcels-post movement during year	773,105

The development of the telegraphic system makes as good a showing as that of the railroad system and the Postal service as indicated by the following figures: 1876, 9,927 kilometers; 1885, 15,750 kilometers; 1909 (September), 68,446 kilometers. This last figure corresponds only to the Federal system and does not include telegraphic lines belonging to railroads nor the private ones of the states, nor the submarine cables which easily would bring said figure to nearly 100,000 kilometers.

As a complement to the efforts made by the government in favor of by-ways of travel, interior and exterior, we must mention the work done in the ports, which is so necessary to modern commerce.

Mexico possesses several good natural harbors on the Gulf as well as on the Pacific. But as natural harbors never suffice for the demands of modern commerce, it happened that traffic had concentrated for years in the poor ones, particularly in the one of Vera Cruz—open to the four winds and exposed to all weathers. The need of good ports became as imperative as well as quick modes of travel, and General Diaz provided for such an urgent necessity.

The works at Vera Cruz have fulfilled all expectations. Thanks to them, that

one-time almost impossible harbor, is to-day a safe port, with good wharves, which permit the loading and unloading of cargoes from the ships directly to the dock—a thing impossible before.

Tampico, in importance the second harbor of the republic, also claimed the attention of the government. Aiding the Central Railroad Company, which had constructed a branch to Tampico, the government dredged the bar which had periodically closed the harbor, and now there is a passage-way for deep-water ships at all times.

Other ports on the Gulf have also claimed the special attention of the government, although in a lesser way, such as Progreso, Laguna, Campeche, San Juan, Bautista, Tuxpan and Frontera, in all of which have been constructed, with official help, wharves, dry-docks and warehouses.

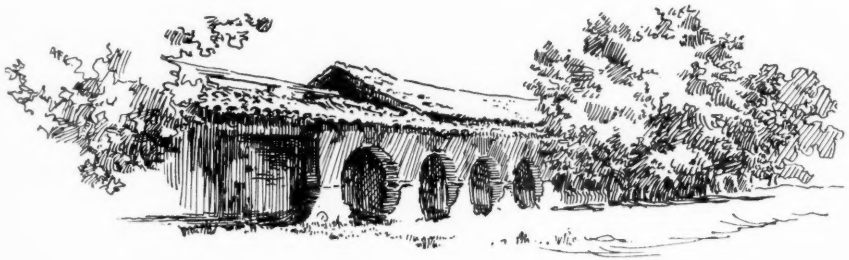
On the Pacific side Manzanillo has been the port of progress, probably because the railroad which has its terminus there was about to be completed. Here has been constructed a breakwater and several docks for the service of the harbor, besides the dredging of two marshy lagoons, which made the harbor unhealthy. But where the initiative of General Diaz has made itself most felt is in the construction of the ports of Coatzacoalcos and Salina Cruz—terminals of the Tehuantepec Railway. These ports constructed at an enormous expense, meeting all the requirements of modern science, do honor to the administration which, regardless of cost, finished them as an indispensable complement to the Isthmian road.

Mining has obtained from the Diaz government the wisest and most liberal legislation that could be had, and, notwithstanding the heavy depreciation of silver, the development has been far greater than could have been expected, and thus Mexico to-day has reached one of the first places among silver-producing countries of the world.

Agriculture owes to the government many advances, such as liberal concessions for irrigation, active encouragement for new products, reforms in the teaching of agriculture, and distributing plants and seeds. The government has given all franchises possible, including waterfalls to be used for power, and has stimulated, with exemption of taxes and other advantages, the implanting of new and unexploited industries.

As a result of this efficient and persevering action, a thorough development of all the branches of the country's richness has been obtained—an augmentation in the agricultural production which from $73,000,000 in 1876, has reached nearly $500,000,000 in 1909; an increase in exports which from $27,300,000 reaches in 1907-1908 the sum of $242,740,201; an increase in the imports of $18,800,000, in round numbers, in 1874-1875 to $221,757,464.

And this is not all. Material improvements besides those mentioned, have been many, such as hospitals, asylums, theaters, schools, administrative palaces; reorganization, discipline and technical education of the army; suppression of contraband and highway robbery; extension and cordiality of relations with all civilized nations; reorganization of public education and finances—such is the marvelous achievement of the Diaz administration.



Again the Busy Bee

How the Tiny Blastophaga Has Made Possible California's Growing Fig Industry

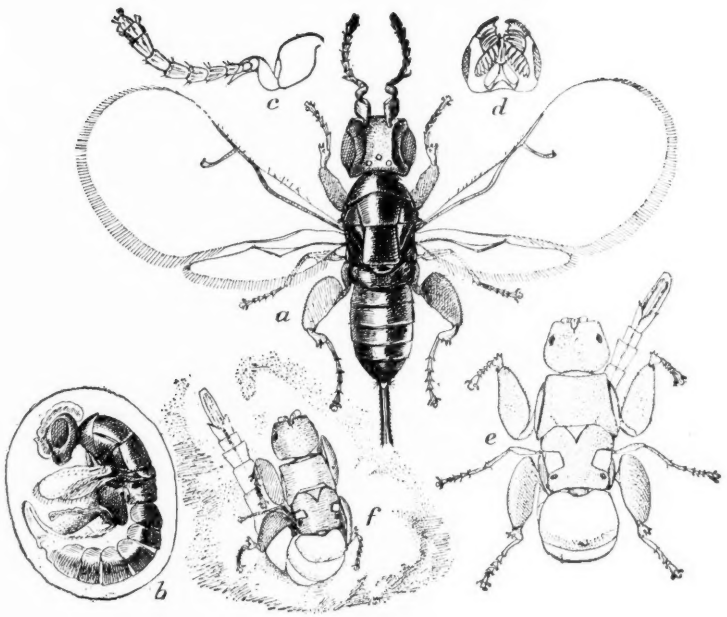
By JOHN L. COWAN

IN the annals of California horticulture are many romances, but none more striking than that relating the story of the introduction of the fig-wasp. Upon the activities of this individually insignificant bug, so called, depends absolutely the commercial production of dried Smyrna figs. This represents an industry as yet in its infancy in America, but one which may some day rival the production of raisins or prunes in importance, or possibly rank second only to citrus fruits in the value of its annual output. Never have men labored longer or under greater discouragements for a purpose seemingly so little proportioned to the efforts put forth. The fig-wasp itself is hardly larger than a small gnat, but to induce it to propagate its kind in California, cost many thousands of dollars and many years of endeavor, necessitating wearisome trips to the Orient and long sojourns in the land where the insect made its home. The assistance of the American consular service, the resources of the Department of Agriculture, and the enterprise and persistence of private experimenters, all combined to the same end, at last triumphed over difficulties that for a time seemed insurmountable, and the result is seen in the successful establishment of an industry that now pays half a million dollars annually into the hands of California orchardists and fruit packers, and that is sure to grow to vast proportions within the next decade.

Almost from the beginning of tradition, the fig has been esteemed as one of the most valuable of food staples in the countries in which it flourished. It is native to Western Asia—from Syria to Kurdistan—and, as some of the varieties that are eaten fresh bear three crops annually, it formed one of the chief means of subsistence to the people inhabiting the region in which it grew—in an age when cereals were not extensively cultivated. With the vine, the fig-tree was the accepted emblem of peace and prosperity, and in the days of the Biblical patriarchs, the man who "sat under his own vine and fig-tree" was regarded as fortunate and of a surety content, while the failure of the fig-crop or the destruction of the fig-tree was considered indicative of the wrath of God.

Inevitably, a fruit so highly esteemed has been carried by man in his wanderings to every country in which it will flourish. It was introduced into the warmer parts of America soon after the beginning of European colonization, and a number of varieties have long been grown for table use in the Gulf states and California. However, notwithstanding the wide dissemination of the fig-tree, the production of dried figs remained practically a monopoly of the countries bordering the Mediterranean, particularly Turkey and Algeria.

When the production of other tropical and semi-tropical fruits began to reach important proportions in California, it was only natural that fruit growers should begin to ask why they could not produce dried figs also, in competition, in the home market, with the fig-growers of the Mediterranean countries. From asking the question to making the attempt was a short step, but even the most enthusiastic Californian could not deny that the home-grown product was so far inferior to the imported article that real competition was out of the question. For years a considerable quantity of the California Mission figs, as the variety introduced by the Franciscan fathers more than a century before, was called, and of a later importation from Europe, known as the White Adriatic, were dried and marketed at from seven and one-half to ten cents a pound—but, each year, as soon as the new



The Fig-Wasp

Fig 2. Blastophaga Grossorum—*a*, adult female with wings extended, seen from above; *b*, female not entirely issued from pupal skin and still contained in gall; *c*, antenna of female; *d*, head of female from below; *e*, adult male; *f*, the same—all greatly enlarged. *Courtesy of U. S. Department of Agriculture* —See note below

crop of Smyrna figs began to arrive, the demand for the California product fell almost to the vanishing point.

It was plain that something was wrong. That there was any deficiency in California's soil or climate, no Californian believed for a moment. It was evident then, that the fault lay in the variety of fruit cultivated—and everyone believed that the one thing needful was to introduce the Smyrna fig. This was first undertaken with a small shipment in 1879 by G. P. Rixford of the San Francisco *Bulletin*. Through the assistance of the United States Consul at Smyrna, E. J. Smithers, and in 1881 and 1882, he imported thousands of cuttings, and distributed them widely among nurserymen and fruit growers throughout the state. The cuttings rooted readily, and the public-spirited innovator rejoiced in the belief that he had started fig-growers upon the straight road to certain success. His rejoicing was short-lived. It was not long until the imported trees began to bear. To the wonderment of everyone, the fruit grew to the size of small marbles and then fell from the trees. Every owner of a Smyrna fig-tree had the same experience, and this was repeated year after year. The only explanation anyone could offer was that the fig-growers of Symrna had purposely supplied the American Consul with cuttings of a worthless variety, in order to defeat the introduction of the true Smyrna fig into America. No one was inclined to greatly blame the Smyrna people for desiring to retain control of the world's dried-fig trade, but many did emphatically censure Mr. Rixford and the *Bulletin* company for being so easily duped. Some dug up their fig-trees, and others permitted them to stand as ornamental

NOTE—THE LARVA OF THE FIG-WASP—The young larva is a delicate little creature curved upon itself and showing no visible segmentation. It takes many days development of the Capri fig before the larva becomes visible with certainty without the most careful observation under a strong lens. The first sign that indicates that one is watching the larva and not the sap in the gall is the visibility of two brownish spots, which are, without doubt, the mandibles of the larva. When these spots become visible with a very powerful hand-lens (one-fourth inch Tolles triplet), the larva is more than two-thirds grown and the segmentation of the body has become noticeable. It is a very difficult thing to dissect the larva out of the gall without crushing it, but it can be accomplished with care by the aid of dissecting needles. No casting of the skin has been observed. With the growth of the larva the gall greatly resembles a seed, turning light-brown in color; the galls containing females being much darker than those containing males.

trees, or to serve as a warning against too great credulity, or against taking up too readily with fads of doubtful utility.

Among the earliest investigators of the possibilities of dried-fig production in California were F. Roeding, and his son, George C. Roeding, nurserymen, of Fresno. Having become convinced that dried-fig production would never cut much of a figure in California unless the Smyrna fig could be successfully cultivated, in 1886, they sent W. C. West to Smyrna to investigate the industry in the country in which it has always been prosecuted with the most conspicuous success. Mr. West found out some things about fig production that California orchardists would hardly have believed but for the researches of Dr. Gustav Eisen, then of the California Academy of Sciences. Dr. Eisen showed that Aristotle, Theophrastus and other early writers had described the practice of the Orientals, of picking the wild, or Capri, figs at a certain time of year, and placing them among the branches of the cultivated trees. He explained the reason for this—namely, that a little insect issued from the wild figs, covered with pollen from their blossoms, and entered the cultivated figs, fertilizing them and causing their fruit to come to maturity. What Dr. Eisen learned about caprification by delving among the dusty tomes of the ancients, Mr. West learned by actual observation in the valley of the Maeander river—the principal source of the world's supply of Smyrna figs.

It is a common jest in fig countries to tell visitors from the East that whoever finds a fig-blossom will be married within a year. The most careful examination of a fig-tree fails to reveal anything that looks in the least like a flower—there is nothing but figs, and leaves, and little button-like knobs that are plainly undeveloped figs. So many people say—and doubtless believe—that the fig-tree bears no blossoms. As a fact, the whole fig is simply a receptacle for a mass of small flowers. At the apex of this receptacle is a small orifice, so that there is always open a passageway to the very heart of the fig.

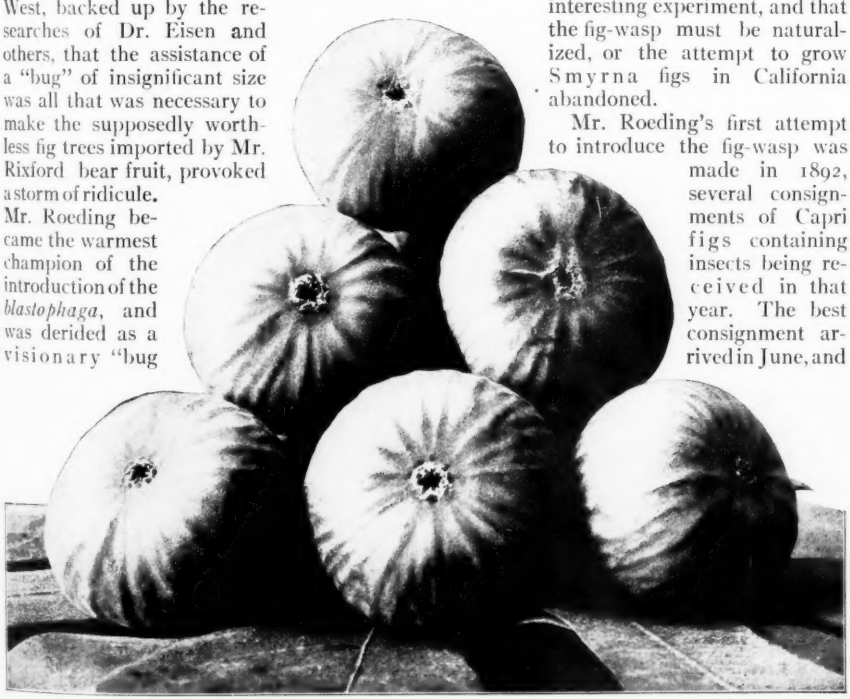
Capri fig, full size, cut open. The fig-wasps can be seen crawling upon the white surface of the upper half

The figs used in California, and throughout the world, for table use, contain what are known as "mule" flowers, malformed pistillate flowers. The fruit matures without the agency of the

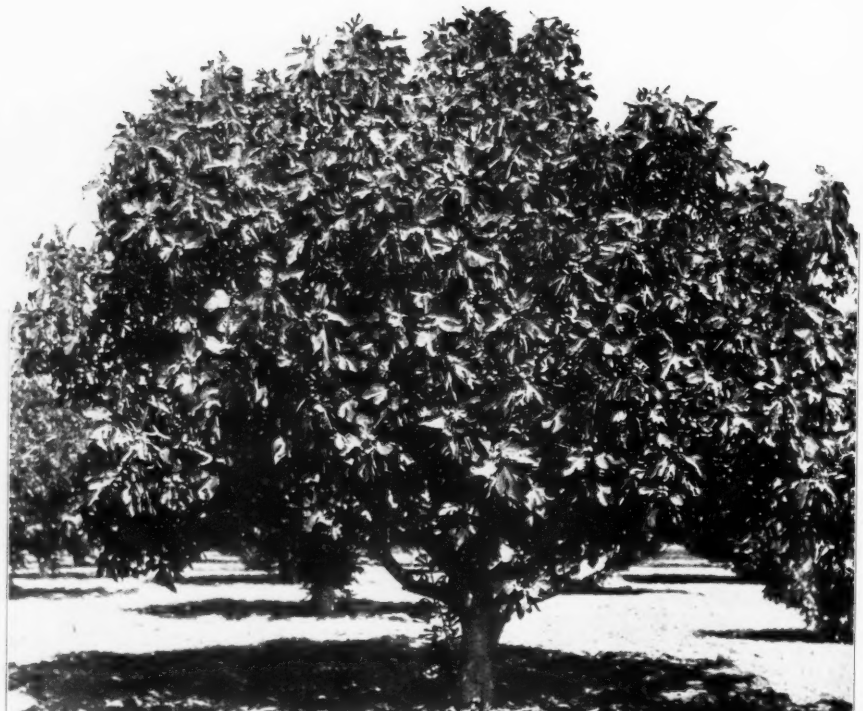
fig-wasp, but the seeds are hollow, and the fruit itself inferior in flavor and deficient in sweetness, as compared with the Symrna fig. The Symrna fig contains only female blossoms, and will not mature unless fertilized by the transference to them of pollen from the blossoms of the Capri fig. This is the office performed by the fig-wasp, or *blastophaga grossorum*, which makes its home and breeding-place in the interior of the Capri fig. To enable it to perform this function, for ages the Orientals have been accustomed to taking the matured Capri figs, stringing them upon rushes, and hanging them among the branches of the trees that yield the commercial figs. This constitutes caprification —a process of such importance that in Asia Minor and other fig-producing countries the Capri fig is an article of commerce solely for the sake of the insects it contains.

In the light of present-day knowledge, it may seem strange that California fruit men were so slow in finding out the cause of their first failures with the Smyrna fig-trees. Hindsight is so very much better than foresight! Nevertheless, the testimony of Mr. West, backed up by the researches of Dr. Eisen and others, that the assistance of a "bug" of insignificant size was all that was necessary to make the supposedly worthless fig trees imported by Mr. Rixford bear fruit, provoked a storm of ridicule. Mr. Roeding became the warmest champion of the introduction of the *blastophaga*, and was derided as a visionary "bug farmer." He made extensive plantings of both Smyrna and Capri fig-cuttings forwarded by Mr. West, knowing at the time that the introduction of the fig-wasp would be necessary to make the enterprise successful, but anticipating no particular difficulties. In 1890, a few of both the Capri and Smyrna trees produced fruit, and it was decided to try artificial pollenization. So some of the Capri figs were opened, the pollen shaken out, and transferred by means of wooden toothpicks through the orifices of the Smyrna figs into their interior. The fruit thus artificially fertilized remained on the trees and matured perfectly, although it was impossible by this means to fertilize all the mass of flowers in the interior of the receptacle, so that the figs thus produced were still inferior to the imported figs. Experiments of a similar nature were continued for a number of years, with much the same results, making it plain that the one thing needful to make Smyrna fig-production a commercial success, was to accomplish the perfect fertilization of the flowers. It was equally plain that artificial fertilization never could be more than a curious and interesting experiment, and that the fig-wasp must be naturalized, or the attempt to grow Smyrna figs in California abandoned.

Mr. Roeding's first attempt to introduce the fig-wasp was made in 1892, several consignments of Capri figs containing insects being received in that year. The best consignment arrived in June, and



Pyramid of Calimyrna, the improved California figs (about half their natural size)



A typical Calimyrna fig tree at the Fancher Creek Nurseries, Fresno, California

the figs were promptly taken to the orchard and hung in trees covered with cloth to prevent the insects from escaping. In 1895, another small shipment was received, and still another the following year. All these attempts to introduce the stubborn insects proved unavailing. Then, in 1897, the State Board of Trade at San Francisco made strong representations to the Secretary of Agriculture, of the great importance of naturalizing the *blastophaga* in America. He referred the whole subject to Dr. L. O. Howard, of the Division of Entomology, who took it up with characteristic energy and zeal, and in 1898, several consignments of Capri figs containing the insects were forwarded by Walter T. Swingle, who was then studying at the International Biological Laboratory at Naples, and took up this matter of his own initiative. The next year he was sent to Algiers by the Department of Agriculture to secure date-palms, and continued to send Capri figs containing the wasp from there. These were sent to Mr. Roeding, who used every endeavor to supply the proper conditions for the propagation of the insects, but met with the same result that had followed his own importations—complete and discouraging failure.

In 1899, Mr. Swingle forwarded another series of consignments, using extraordinary precautions to insure that the figs with their precious contents would arrive in perfect condition. Every fig was wrapped separately in tin-foil, and all were packed in cotton in a wooden case. Mr. Roeding received these in April, and gave them the usual care, but without hope of success.

But the end had come at last to the long series of fruitless endeavors. In June it was discovered that some of the insects had left the Capri figs in which they had arrived, and had fertilized some of the fruit growing in the orchard. During the summer the insects continued to breed, passing through

four generations in all. The period of hibernation was passed successfully, and at the proper time the next summer, the wild, or Capri, figs were transferred to the Smyrna trees. In August and September a crop of fifteen tons was harvested and packed. These were tested chemically, and were found to contain 1.4 per cent more sugar than the imported product. The problem of producing commercially valuable dried-figs in California had been solved at last, and not the least gratifying feature of the solution lay in the circumstance that the California dried-figs were unquestionably superior even to the Symrna figs, which had, up to that time, been the world's standard of excellence.

George C. Roeding of Fresno, whose industry and persistence has made possible, profitable fig-culture in California

The honors of this final triumph over difficulties must be divided between Mr. Roeding and the Department of Agriculture. The Department of Agriculture imported the insects, but it was Mr. Roeding who naturalized them. His years of failure provided him with the experience that made final success possible, and his orchards that had been growing for years with trees of both Capri and Smyrna varieties, were in perfect readiness to give the imported denizens of the Orient a congenial home. He bore without flinching the heavy financial loss, the apparently interminable succession of unforeseen expenses, the disheartening series of disappointments, the ridicule of wiseacres who could not believe that an insignificant insect could play so large a part in the economy of nature. Without denying to other experimenters all praise for their endeavors, it cannot be gainsaid that Mr. George C. Roeding is the real founder of the industry of producing and packing commercially valuable dried-figs in America, and that, but for his persistence and his unshaken faith in the ultimate success of his endeavors, the monopoly so long enjoyed by the Orient and the Mediterranean countries would remain unbroken to this day.

But the whole problem of competing with the Orient in the production of commercial figs in the world's markets was not solved with the naturalization of the fig-wasp. That was the decisive factor—but there were details to be learned, relating to caprification, curing and packing. Accordingly, in May, 1901, Mr. Roeding started for Smyrna, in order to study the fig industry on the ground—in the valley of the Maeander—where the world's finest figs were grown. There he obtained a full insight into every phase of the industry—not without difficulty, however, for an inkling of his errand had preceded him, and he found the people decidedly averse to teaching to a possible competitor the intricacies of the business to which they owed their livelihood. Mr. Roeding showed no such spirit on his return to America. On the contrary, he embodied all the information gained on his visit to the Orient, and through all his years of experimenting, in a book, "The Smyrna Fig at Home and Abroad," for distribution at a nominal price, for the purpose of lending every possible assistance and encouragement to anyone wishing to engage in this infant industry. It is from this book—the classic of American fig-production—that the major part of the information contained in this article has been derived. To write intelligently of the history of the industry in this country without some reference to it would be hardly possible.

It is evident from what has been said that two distinct species of fig-trees are essential to the successful production of commercial figs—the Smyrna fig-tree, grown for the sake of its fruit, and the Capri

Three scientists whose investigations have made American fig culture possible
Dr. Gustav Eisen (on left, seated), G. P. Rixford (standing)
Walter T. Swingle (seated)

fig-tree, grown for the sake of the insect that breeds within it. As a matter of practical fig-growing, three distinct varieties of Capri figs are found to be necessary, maturing their fruit at different times, in order to make provision for the fertilization of the unevenly developing Smyrna figs. The Capri fig-trees produce three or four crops each season, depending upon climatic conditions. In the San Joaquin Valley, the first crop appears in March and ripens in June; the second and third crops appear in June and July and ripen in August and September; and the last crop appears in September and October and remains on the trees all winter. There must be fruit on the trees at all times, so that when the fully-developed insect emerges from the figs of the matured crop, there will be undeveloped figs of the succeeding crop in which it may deposit its eggs.

The first crop, ripening in June, is the essential one—for it is the only one developing an abundance of male flowers. Simultaneously with the ripening of this crop of Capri figs, the first Smyrna figs are

in the receptive stage—the pistillate blossoms ready to receive the pollen. It is at this stage that the fig-grower first interferes with the processes of nature, knocking the matured Capri figs from the trees with light bamboo poles, and taking them to the Smyrna fig-trees, where a number are placed in small wire-mesh baskets previously placed in each tree. The baskets alone, however, do not suffice, as it is possible that the fruit high up in the trees and near the extremities of the branches might not be reached by the insects. So additional Capri figs are strung upon raffia and thrown up into the trees, making sure that the insects as they emerge will make their way to fruit upon every branch, in their search for suitable places in which to deposit their eggs. This, of course, is the sole object the *blastophaga* has in view in leaving the matured fig and seeking one not matured—to deposit its eggs for the perpetuation of the species. The fertilization of the fig-blossoms is purely accidental, so far as the insect is concerned. In four or five days another distribution of Capri figs is necessary and perhaps a third still later, as the development of new fruit upon the Smyrna fig-trees extends over a considerable period of time. Within ten days after caprification, a remarkable change takes place in the appearance of the figs that have been fertilized. They take on a healthy green color and develop rapidly, while those that have not been fertilized turn a yellowish-green shade, cease to grow and soon shrivel and drop from the trees.

At the present time there are about four thousand acres of fig orchards in California, producing eight million pounds of dried-figs annually. The importations of dried-figs from the Mediterranean countries vary from twenty million to twenty-six million pounds annually. It is evident, then, that the present American production will have to be quadrupled in order to take care of the present home demand—and by that time the domestic consumption will be vastly greater. However, if the traditions of California horticulture are to be observed (as no one doubts that they will be) the fig-growers of the state will never be content with supplying the markets of the United States with dried-figs. The markets of the world are open to them, and it is just as inevitable as fate that the history of prune and raisin production will be duplicated—that California figs will one day dominate the markets of Western and Northern Europe, and compete with the Smyrna fig in the Orient and throughout the countries that border the Mediterranean.

In this coming struggle for a world market for American figs, American producers have two advantages of the highest importance. The first is the unquestioned superiority of the natural product. The Calimyrna fig (as the improved California variety is called) is sweeter and superior in flavor even to the famous Smyrna figs of the Maeander valley. The second advantage is even more important—the California figs are cured, packed and prepared for the consumer with a care, a cleanliness and a regard for sanitary precautions which it is quite hopeless that the Orientals will ever attempt to emulate. The disgusting worms frequently found in imported figs are unknown in the American product, and returning travelers are a unit in the declaration that the traditional uncleanliness of Orientals and inhabitants of the south of Europe are unpleasantly maintained in the packing-houses through which pass the dried-figs that supply all of the world's markets, excepting the relatively small portion that look to California. However, it must not be inferred that California is to have a monopoly of the dried-fig production of America. The commercial fig is less exacting in its climatic requirements than the orange and lemon. It can be grown with success in the lower altitudes of Arizona, New Mexico, Texas and portions of old Mexico and other regions with arid summers, and above all freedom from rain during the ripening season. All districts with moist climates can hope only to produce figs for marketing in a fresh state. To these regions belong the major portion of the Gulf states, and probably in the Carolinas, as well as in Hawaii, Cuba, Porto Rico and the West Indies. Not the least of the advantages that fig-growing offers to orchardists, is the fact that the fig-tree has no dangerous insect enemies, and is practically immune from disease. What this means in peace of mind, as well as in the saving of money, no one but the practical fruit-grower who has combated insect pests and has seen diseases ruin his orchards, can fully appreciate.

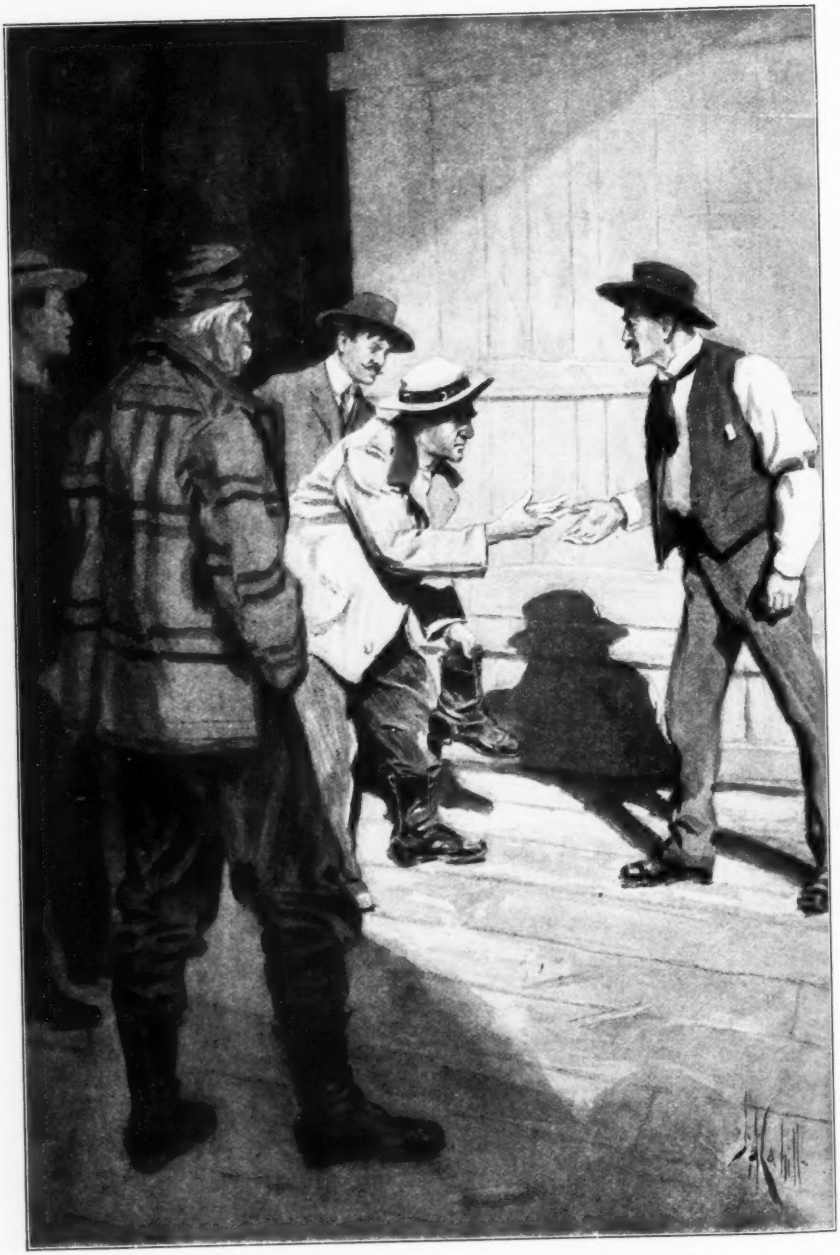
Fig-trees require rather less care and attention than most other fruits, but neglect is poor economy. In California, where the

Sorting and stringing Capri figs containing the Blastophaga, preparatory to placing them upon Smyrna trees

rainfall is ten inches or more, annually, irrigation is not necessary. The crop continues to ripen through a period of about six weeks, beginning in August, making it more easily and economically handled than if the season of maturing was short. The fruit is far progressed in drying before it falls, so that one or two days exposure in the sun starts it well upon the final curing process. First of all the figs as taken from the orchard are dipped in salt water, heated to the boiling point, for the double purpose of hastening the final drying and of softening the skins. Then they are spread upon trays and taken to the drying ground. The figs are sufficiently dried when they give a slight leathery feeling when worked between the fingers. They are then piled in a sweating-room or are dumped into sweat-boxes where they remain for a period of ten days or more, so that the moisture in the figs may be properly equalized. After having passed through this sweating process they are perfectly cured.

They are then thoroughly washed in slightly saline water for the removal of sand or any other foreign substances, after which they present a smooth, glossy appearance, with tender, white skins. Next they pass through the fig-grader, consisting of a series of galvanized trays operated by power. The first tray has holes three-quarters of an inch in diameter; the second, one inch; and the third, one and one-fourth inches. The figs that pass through the first tray are not packed, but the others, grading from the smallest to the largest size, are packed to suit the various requirements of the trade.

Before packing, the dried-figs are placed in trays having wire-screen bottoms, and thoroughly steamed, to destroy possible insect-life and germs, and to render them soft and pliable. They are then carefully placed by hand into hardwood forms, pressed into bricks, weighed, wrapped in waxed paper, and finally sealed in attractive half-pound and one-pound cartons. These are packed in wooden boxes for shipment to the trade. In these paper-cartons the best grades of California figs reach the consumer, who has the satisfaction of knowing that in this typical California product he obtains not only the best dried-fig produced in the world, but an article of food that is as clean, wholesome and free from impurities as anything prepared by human hands can well be.



Roaring Dick pulled off his boot, from which he extracted a pulpy mass of greenbacks

See "The Rules of the Game"—page 410

The Rules of the Game

By STEWART EDWARD WHITE

Author of The Blazed Trail; Arizona Nights; The Riverman, Etc.

ILLUSTRATED BY J. A. CAHILL

CHAPTERS VI TO XII

BEGUN IN THE FEBRUARY NUMBER

BOB followed this streaming multitude to the large structure pointed out to him as the boarding-house. It was a commodious affair with a narrow veranda to which led steps picked out by the sharp caulks of the rivermen's boots. A round stove held the place of honor in the first room. Benches flanked the walls. At one end was a table-sink and tin wash-basins and roller-towels. The men were splashing and blowing in the plunge-in-all-over fashion of their class. They emerged slicked down and fresh, their hair plastered wet to their foreheads. After a moment a fat and motherly woman made an announcement from a rear room. All trooped out.

The dining-room was precisely like those Bob remembered from his childhood. There were the same long tables covered with red oilcloth, the same pine benches were smooth and shiny, the same thick crockery, and the same huge receptacles steaming with hearty—and well-cooked—food. Nowhere does the man who labors with his hands fare better than in the average lumber-camp. Forest operations have a largeness in conception and execution that leads away from the habit of the mean, small and foolish economies. At one side, and near the windows, stood a smaller table. The covering of this was turkey-red cloth with a white pattern; it boasted a white-metal "caster"; and possessed real chairs. Here Bob took his seat, in company with Fox, Collins, Mason, Tally and the half-dozen active young fellows he had seen handling the scaling-rules near the ships.

At the men's tables the meal was consumed in a silence which, Bob learned later, came nearer being obligatory than a matter of choice. Conversation was discouraged by the good-natured, fat woman,

Mrs. Hallowell. Talk delayed; and when one had dishes to wash—

The "boss's table" was more leisurely. Bob was introduced to the scalers. They proved to be, with one exception, young fellows of twenty-one or two, keen-eyed, brown-faced, alert and active. They impressed Bob as belonging to the clerk class, with something added by the outdoor, varied life. Indeed, later he discovered them to be sons of carpenters, mechanics and other higher class, intelligent workingmen; boys who had gone through high school, and perhaps a little way into the business college; ambitious youngsters, each with a different idea in the back of his head. They had in common an air of capability, of complete adequacy for the task in life they had selected. The sixth scaler was much older and of the riverman type. He had evidently come up from the ranks.

There was no general conversation. Talk confined itself strictly to shop. Bob, his imagination already stirred by the incidents of his stroll, listened eagerly. Fox was getting in touch with the whole situation.

"The main drive is down," Tally told him, "but the Cedar Branch hasn't got to the river yet. What in blazes did you want to buy that little strip this late in the day for?"

"Had to take it—on a deal," said Fox briefly, "Why? Is it hard driving? I've never been up there. Welton saw to all that.

"It's hell. The pine's way up at the headwaters. You have to drive her the whole length of the stream through a mixed hardwood and farm country. Lots of partridges and mossbacks, but no improvements. Not a dam the whole length of her. Case of hit the freshet water or get hung."

"Well, we've done that kind of a job before."

"Yes, *before*," Tally retorted, "if I had a half-crew of good, old-fashioned white-water birlers, I'd rest easy. But we don't have no crews like we used to. The old bully boys have all moved out West—or died."

"Getting old—like us," bantered Fox, "Why haven't you died off too, Jim?"

"I'm never going to die," stated the old man, "I'm going to turn into a grindstone and wear out. But it's a fact. There's plenty left that can ride a log all right, but they're a tough lot. It's too close here to Marion."

"That *is* too bad," condoled Fox, "especially as I remember so well what a soft-spoken, lamb-like, little tin angel you used to be, Jim."

Fox, who had quite dropped his old office-self, winked at Bob. The latter felt encouraged to say:

"I had a course in college on archeology. Don't remember much about it, but one thing. When they managed to decipher the oldest known piece of hieroglyphics on an Assyrian brick, what do you suppose it turned out to be?"

"Give it up, Brudder Bones," said Tally, dryly, "what was it?"

Bob flushed at the old riverman's tone, but went on:

"It was a letter from a man to his son. In it he lamented the good old times when he was young, and gave it as his opinion that the world was going to the dogs."

Tally grinned slowly, and the others burst into a shout of laughter.

"All right, bub," said the riverman, good-humoredly, "But that doesn't get me a new foreman." He turned to Fox, "Smith broke his leg, and I can't find a man to take charge. I can't go. The main drive's got to be sorted."

"There ought to be plenty of good men," said Fox.

"There are, but they're at work."

"Dicky Darrell is over at Marion," spoke up one of the scalers.

"Roaring Dick," said Tally sarcastically, "—but there's no denying he's a good man in the woods. But if he's at Marion, he's drunk; and if he's drunk, you can't do nothing with him."

"I heard it three days ago," said the scaler.

Tally ruminated. "Well," he concluded, "maybe he's about over with his bust. I'll run over this afternoon and see what I can do with him. If Tom Welton would only tear himself apart from California, we'd get on all right."

A scraping back of benches and a tramp of feet announced the nearly simultaneous finishing of feeding at the men's tables. At the boss's table everyone seized an unabashed toothpick. Collins addressed Bob.

"Mr. Fox and I have so much to go over this afternoon," said he, "that I don't believe I'll have time to show you. Just look around a little."

On the porch outside, Bob paused. After a moment he became aware of a figure at

his elbow. He turned to see old Jim Tally bent over to light his pipe behind the mahogany of his curved hand.

"Want to take in Marion, bub?" he inquired.

"Sure!" cried Bob heartily, surprised at this mark of favor.

"Come on then," said the old riverman. "The lightning express is gettin' anxious for us."

VII

THEY tramped to the station and boarded the single passenger car of the accommodation. There they selected a forward seat and waited patiently for the freight-handling to finish and for the leisurely puffing little engine to move on. An hour later they descended at Marion. The journey had been made in almost an absolute silence. Tally stared straight ahead and sucked at his little pipe. To him, apparently, the journey was merely something to be endured; and he relapsed into that patient absent-mindedness developed among those who have to wait on forces that will not be hurried. Bob's remarks he answered in monosyllables. When the train pulled into the station, Tally immediately arose as though released by a spring.

Bob's impression of Marion were of great mills and sawdust burners along a wide river; of broad, sawdust-covered streets; of a single block of good brick stores on a main thoroughfare which almost immediately petered out into the vilest and most ramshackle frame "joints"; of wide side streets flanked by small, painted houses in yards, some very neat, indeed. Tally walked rapidly by the respectable business blocks, but pushed into the first of the unkempt, frame saloons beyond. Bob followed close at his heels. He found himself in a cheap barroom, its paint and varnish scarred and marred, its floor sawdust-covered, its center occupied by a huge stove, its walls decorated by several pictures of the nude.

Four men were playing cards at an old round table, hacked and bruised and blackened by time. One of them was the barkeeper, a burly individual with black hair plastered in a "lick" across his forehead. He pushed back his chair and ducked behind the bar, whence he greeted the newcomers. Tally proffered a question. The barkeeper relaxed from his professional attitude and leaned both elbows on the bar. The two conversed for a moment; then Tally nodded briefly and went out. Bob followed.

This performance was repeated down the length of the street. The stage settings varied little; same oblong painted rooms; same varnished bars down one side; same mirrors and bottles behind them; same sawdust-strewn floors; same pictures on the walls; same obscure, back rooms; same sleepy card games by the same burly, but sodden type of men. This was the off season. Profits were now as slight as later they would be heavy. Jim talked with the barkeepers low-voiced, nodded and went out. Only when he had systematically worked both sides of the street did he say anything to his companion.

"He's in town," said Tally, "but they don't know where."

"Whither away?" asked Bob.

"Across the river."

They walked together down a side street to a long wooden bridge. This rested on wooden piers shaped upstream like the prow of a ram in order to withstand the battering of the logs. It was a very long bridge. Beneath it the swift current of the river slipped smoothly. The breadth of the stream was divided into many channels and pockets by means of brown poles. Some of these were partially filled with logs. A clear channel had been preserved up the middle. Men armed with long pike-poles were moving here and there over the booms and the logs themselves, pushing, pulling, shoving a big log into this pocket, another into that, gradually segregating the different brands belonging to the different owners of the mills below. From the quite considerable height of the bridge all this lay spread out mapwise up and down the perspective of the river. The smooth, oily current of the river, leaden-hued and cold in the light of the early spring, hurried by on its way to the lake, swiftly, yet without the turmoil and fuss of lesser power. Down stream, as far as Bob could see, were the huge mills with their flanking lumberyards, the masts of their lading ships, their black sawdust burners, and above all the pure, white, triumphant banners of steam that shot straight up against the gray of the sky.

Tally followed the direction of his gaze.

"Modern work," he commented. "Band-saws. No circulars there. Two hundred

thousand a day," with which cryptic utterance he resumed his walk.

The opposite side of the river proved to be a smaller edition of the other. Into the first saloon Tally pushed.

It resembled the others except that no card-game was in progress. The barkeeper, his feet elevated, read a pink paper behind the bar. A figure slept at the round table, its head in its arms. Tally walked over to shake this man by the shoulder.

In a moment the man raised his head. Bob saw a little, middle-aged man, not over five feet six in height, slenderly built, yet with broad, hanging shoulders. His head was an almost exact triangle, the base formed by a mop of red-brown hair, and the apex represented by a very pointed chin. Two level, oblong patches of hair made eyebrows. His features were white and nervous. A strong, hooked nose separated a pair of red-brown eyes, small and twinkling, like a chipmunks. Just now they were bloodshot and vague.

"Hullo, Dicky Darrell," said Tally.

The man struggled to his feet, knocking over the chair, and laid both hands effusively on Tally's shoulders.

"Jim!" he cried thickly. "Good ole Jim! Glad to see you! Hav' drink!"

Tally nodded and, to Bob's surprise, took his place at the bar.

"Hav' 'nother!" cried Darrell, "God! I'm glad to see you! Nobody in town."

"All right," agreed Tally, pacifically, "but let's go across the river to Dugan's and get it."

To this Darrell readily agreed. They left the saloon. Bob, following, noticed the peculiar truculence imparted to Darrell's appearance by the fact that in walking he always held his hands open and palms to the front. Suddenly Darrell became, for the first time, aware of his presence. The riverman whirled on him, and Bob became conscious of something as distinct as a physical shock as he met the impact of an electrical nervous energy. It passed, and he found himself half-smiling down on this little, white-faced man with the matted hair and the bloodshot, chipmunk eyes.

"Who'n hell's this!" demanded Darrell, savagely.

"Friend of mine," said Tally. "Come on."

Darrell stared a moment longer. "All right," he said, at last.

All the way across the bridge Tally argued with his companion.

"We've got to have a foreman on the Cedar Branch, Dick," he began, "and you're the fellow."

To this Darrell offered a profane, emphatic and contemptuous negative. With consummate diplomacy Tally led his mind from sullen obstinacy to mere reluctance. At the corner of Main street the three stopped on the corner.

"But I don't want to go yet, Jim," pleaded Darrell, almost tearfully. "I ain't had all my 'time' yet."

"Well," said Tally, "you've been polishing up the flames of hell for four days pretty steady. What more do you want?"

"I ain't smashed no rig yet," objected Darrell.

Tally looked puzzled.

"Well, go ahead and smash your rig and get done with it," he said.

"A' right," said Darrell cheerfully

He started off briskly, the others following. Down a side street his rather uncertain gait led them to the wide-open door of a frame livery-stable. The usual loungers in the usual tipped-back chairs greeted him.

"Want m' rig," he demanded.

A large and leisurely man in shirt-sleeves lounged out from the office and looked him over dispassionately.

"You've been drunk four days," said he, "have you the price?"

"Bet y'," said Dick cheerfully. He seated himself on the ground and pulled off his boot from which he extracted a pulpy mass of greenbacks. "Can't fool me!" he said cunningly. "Always save 'nuff for my rig!"

He shoved the bills into the liveryman's hands. The latter straightened them out, counted them, thrust a portion into his pocket, and handed some back to Darrell.

"There you are," said he. He shouted an order into the darkness of the stable.

An interval ensued. The stableman and Tally waited imperturbably, without the faintest expression of interest in anything evident on their immobile countenances. Dicky Darrell rocked back and forth on his heels, a pleased smile on his face.

After a few moments the stableboy led out a horse hitched to the most ramshackle and patched-up old side-bar buggy Bob had ever beheld. Darrell, after several vain attempts, managed to clamber aboard. He gathered up the reins and, with exaggerated care, drove into the middle of the street.

Then suddenly he rose to his feet, uttered an ear-piercing, exultant yell, hurled the reins at the horse's head, and began to beat the animal with his whip. The horse, startled, bounded forward. The buggy jerked. Darrell sat down violently, but was at once on his feet, plying the whip. The crazed man and the crazed horse disappeared up the street, the buggy careening from side to side, Darrell yelling at the top of his lungs. The stableman watched him out of sight.

"Roaring Dick of the Woods!" said he thoughtfully, at last. He thrust his hands in his pocket and took out the wad of greenbacks, contemplated them for a moment, and thrust them back. He caught Tally's eye. "Funny, what different ideas men have of a time," said he.

"Do this regular?" inquired Tally dryly.

"Every year."

Bob got his breath at last.

"Why!" he cried. "What'll happen to him! He'll be killed sure!"

"Not him!" stated the stableman, emphatically. "Not Dicky Darrell! He'll smash up good, and will crawl out of the wreck, and he'll limp back here in just about one-half hour."

"How about the horse and buggy?"

"Oh, we'll catch the horse in a day or two—it's a spoiled colt, anyway—and we'll patch up the buggy if she's patchable. If not, we'll leave it. Usual program."

The stableman and Tally lit their pipes. Nobody seemed much interested now that the amusement was over. Bob owned a boyish desire to follow the wake of the cyclone, but in the presence of this imperturbability, he repressed his inclination.

"Some day the damn fool will bust his head open," said the liveryman, after a ruminative pause.

"I shouldn't think you'd hire him a horse," said Bob.

"He pays," yawned the other.

At the end of the half-hour the liveryman dove into his office for a coat, which he put on. This indicated he contemplated exercising in the sun instead of sitting still in the shade.

"Well, let's look him up," said he, "this may be the time he busts his fool head."

"Hope not," was Tally's comment. "Can't afford to lose a foreman."

But near the outskirts of the town they met Roaring Dick limping painfully down the middle of the road. His hat was gone and he was liberally plastered with the soft mud of early spring.

Not one word would he vouchsafe, but looked at them all malevolently. His intoxication seemed to have evaporated with his good spirits. As answer to the liveryman's question as to the whereabouts of the smashed rig, he waved a comprehensive hand toward the suburbs. At insistence, he snapped back like an ugly dog.

"Out there, somewhere," he snarled. "Go find it! What the hell do I care where it is? It's mine, isn't it? I paid you for it, didn't I? Well, go find it! You can have it!"

He tramped vigorously back toward the main street, a grotesque figure with his red-brown hair tumbled over his white, nervous countenance of the pointed chin, with his hooked nose and his twinkling chipmunk eyes.

"He'll hit the first saloon, if you don't watch out," Bob managed to whisper to Tally.

But the latter shook his head. From long experience he knew the type.

His reasoning was correct. Roaring Dick tramped doggedly down the length of the street to the little frame depot. There he slumped into one of the hard seats in the waiting-room where he promptly slept. Tally sat down beside him and withdrew into himself. The twilight fell. After an apparently interminable interval a train rumbled in. Tally shook his companion. The latter awakened just long enough to stumble aboard the smoking-car where, his knees propped up, his chin on his breast—he relapsed into deep slumber.

They arrived at the boarding-house late in the evening. Mrs. Hallowell set out a cold supper to which Bob was ready to do full justice. Ten minutes later he found himself in a tiny box of a bedroom, furnished barely. He pushed open the window and propped it up with a piece of kindling. The earth had fallen into a very narrow silhouette, and the star-filled heavens usurped all space, crowding the world down. Against the sky the outlines stood significant in what they suggested and concealed—slumbering rooftops, the satiated mill glowing vaguely somewhere from her banked fires, the blackness and mass of silent lumberyards, the mysterious hushing fingers of the ship's masts, and then, low and vague, like a narrow strip of velvet dividing these

men's affairs from the star-strewn infinite, the wilderness. As Bob leaned from the window the bigness of these things rushed into his office-starved spirit as air into a vacuum. The cold of the lake breeze entered his lungs. He drew a deep breath of it. For the first time in his short business experience he looked forward eagerly to the morrow.

VIII

BOB was awakened before daylight by the unholy shriek of a great whistle. He then realized that for sometime he had been vaguely aware of kindling and stove sounds. The bare little room had become bitterly cold. A gray-blackness represented the world outside. He lighted his glass lamp and took a hasty, shivering sponge-bath in the crockery-basin. Then he felt better in the answering glow of his healthy, straight young body; and a few moments later was prepared to enjoy a fragrant, new-lit, somewhat smoky fire in the big stove outside his door. The bell rang. Men knocked ashes from their pipes and arose; other men stamped in from outside. The dining-room was filled.

Bob took his seat, nodding to the men. A slightly grumpy silence reigned. Collins and Fox had not yet appeared. Bob saw Roaring Dick at the other table, rather whiter than the day before, but carrying himself boldly in spite of his poor head. As he looked, Roaring Dick caught his eye. The riverman evidently did not recognize having seen the young stranger the day before; but Bob was again conscious of the quick impact of the man's personality, quite out of proportion to his diminutive height and slender build. At the end of ten minutes the men trooped out noisily. Shortly a second whistle blew. At the signal the mill awoke. The clang of machinery, beginning slowly, increased in tempo. The exultant shriek of the saws rose to heaven. Bob, peering forth into the young daylight, caught the silhouette of the elephantine tram-horse, high in the air, bending his great shoulders to the starting of his little train of cars.

Not knowing what else to do, Bob sauntered to the office. It was locked and dark. He returned to the boarding-house, and sat down in the main room. The lamps became dimmer. Finally the chore-boy put them out. Then at last Collins appeared, followed closely by Fox.

"You didn't get up to eat with the men?" the bookkeeper asked Bob a trifle curiously. "You don't need to do that. We eat with Mrs. Hallowell at seven."

At eight o'clock the little bookkeeper opened the office door and ushered Bob in to the scene of his duties.

"You're to help me," said Collins concisely, "I have the books. Our other duties are to make out time-checks for the men, to answer the correspondence in our province, to keep track of camp supplies, and to keep tab on shipments and the stock on hand, and the amount sawed each day. There's your desk. You'll find time-blanks and everything there. The copying-press is in the corner. Over here is the tally-board." He led the way to a pine bulletin, perhaps four feet square, into which were screwed a hundred or more small brass screw-hooks. From each depended a small pine tablet or tag inscribed with many figures. "Do you understand a tally-board?" Collins asked.

"No," replied Bob.

"Well, these screw-hooks are arranged just like a map of the lumberyards. Each hook represents one of the lumber piles—or rather the location of a lumber pile. The tags hanging from them represent the lumber piles themselves. See?"

"Sure," said Bob. Now that he understood he could follow out on this strange map the blocks, streets and alleys of that silent, tenantless city.

"On these tags," pursued Collins, "are figures. These figures show how much lumber is in each pile, and what kind it is, and of what quality. In that way we know just what we have and where it is. The scalers report to us every day just what has been shipped out, and what has been piled from the mill. From their reports we change the figures on the tags. I'm going to let you take care of that."

Bob bestowed his long figure at the desk assigned him and went to work. He was interested, for it was all new to him. Men were constantly in and out on all sorts of errands. Fox came to shake hands and wish him well—he was off on the ten o'clock train. Bob checked over a long invoice of camp supplies, manipulated the copying-press, and, under Collins's instructions, made out time-checks against the next pay-day. The insistence of details kept him at the stretch until noon surprised him.

After dinner, and a breath of fresh air, he plunged again into his tasks. Now he had the scalers' noon reports to transfer to the tally-board. He was intensely interested by the novelty of it all; but even this early he encountered his old difficulties in the matter of figures. He made no mistakes, but in order to correlate, remember and transfer correctly, he was forced to an utterly disproportionate intensity of application. To the tally-board he brought more absolute concentration and will-power than Collins to all his manifold tasks. So evidently painstaking was he, that the little bookkeeper glanced at him sharply once or twice. However, he said nothing.

When darkness approached the bookkeeper closed his ledger and came over to Bob's desk. In ten minutes he ran deftly over Bob's afternoon work; rechecking the supply invoices, verifying the time-checks, comparing the tallies with the scalers' reports. So swiftly and accurately did he accomplish this, with so little hesitation and so assured a belief in his own correctness that the really taxing job seemed merely a bit of light mental gymnastics after a day's work.

"Good," he complimented Bob, "everything's correct."

Bob nodded, a little gloomily. It might be correct; but he was very tired from the strain of it.

"It'll come easier with practise," said Collins, "—always difficult to do a new thing."

The whistle blew. Bob went directly to his room and sat down on the edge of his bed. In spite of Collins's kindly-meant reassurances, the iron of doubt had entered his soul. He had tried for four months, and was no nearer facility than when he started.

"If a man hadn't learned better than that, I'd have called him a dub and told him to get off the squad," he said to himself, a little bitterly. He thought a moment. "I guess I'm tired. I must buck up. If Collins and Archie can do it, I can. It's all the Game. Of course, it takes time and training. Get in the Game!"

IX

THIS was on Tuesday. During the rest of the week Bob worked hard. Even a skilled man would have been kept busy by the multitude of details that poured in on the little office. Poor Bob was far from skilled. He felt as awkward amid all these swift and accurate activities as he had when at sixteen, it became necessary to force his overgrown frame into a crowded drawing-room. He tried very hard, as he always did with everything. When Collins succinctly called his attention to a discrepancy in his figurings, he smiled his slow, winning, troubled smile, thrust the hair back from his clear eyes, and bent his lean athlete's frame again to the labor. He soon discovered that this work demanded speed as well as accuracy. "And I need a ten-acre lot to turn around in," he told himself, half-humorously. "I'm a regular ice-wagon."

He now came to look back on his college triumphs with an exaggerated but wholesome reaction. His athletic prowess had given him great prominence in college circles. Girls had been flattered at his attention; his classmates had deferred to his skill and experience; his juniors had, in the manner of college boys, looked up to him as to a demi-god. Then for the few months of the football season the newspapers had made of him a national character. His picture appeared at least once a week; his opinions were recorded; his physical measurements carefully detailed. When he appeared on the streets and in hotel lobbies, people were apt to recognize him and whisper furtively to one another. Bob was naturally the most modest youth in the world, and he hated a "fuss" after the delightfully normal fashion of normal boys, but all this could not fail to have its subtle effect. He went out into the world without conceit but confident of his ability to take his place with the best of them.

His first experience showed him wholly second in natural qualifications and in ability to learn and in training to men subordinate in the business world.

"I'm just plain dub," he told himself. "I thought myself some pumpkins and got all swelled up inside, because good food and leisure and heredity gave me a husky build! Football! What good does that do me here? Four out of five of these rivermen are as husky as I am. Me a business man! Why, I can't seem even to learn the first principles of the first job of the whole lot! I've *got* to!" he admonished himself grimly, "I *hate* a fellow who doesn't make good!" and with a very determined set to his handsome chin he hurled the whole force

of his young energies at those elusive figures that somehow *would* lie.

. The week slipped by in this struggle. It was much worse than in the Chicago office. There Bob was allowed all the time he thought he needed. Here one task followed close on the heels of another, without chance for a breathing space or room to take bearings. Bob had to do the best he could, commit the result to a merciful Providence, and seize the next job by the throat.

One morning he awoke with a jump to find it was seven o'clock. He had heard neither whistle, and must have overslept! Hastily he leaped into his clothes, and rushed out into the dining-room. There he found the choreboy leisurely feeding a just-lighted kitchen fire. To Bob's exclamation of astonishment he looked up.

"Sunday," he grinned, "breakfus' at eight."

The week had gone without Bob's having realized the fact.

Mrs. Hallowell came in a moment later. smiling at the winning, handsome young man in her fat and good-humored manner. Bob was seized with an inspiration.

"Mrs. Hallowell," he said persuasively, "just let me rummage around for five minutes, will you?"

"You that hungry?" she chuckled. "Law! I'll have breakfast in an hour."

"It isn't that," said Bob, "but I want to get some air to-day; I'm not used to being in an office. I want to steal a hunk of bread, and a few of your good doughnuts and a slice of cheese for breakfast and lunch."

"A cup of hot coffee would do you more good," objected Mrs. Hallowell.

"Please," begged Bob, "and I won't disturb a thing!"

"Oh, land! Don't worry about that," said Mrs. Hallowell, "there's teamsters and such in here at all times of the day and night. Help yourself."

Five minutes later Bob, swinging a riverman's canvas lunch-bag, was walking rapidly up the River Trail. He did not know whither he was bound, but here, at last, was a traveled way. It was a brilliant blue and gold morning, the air crisp, the sun warm. The trail led him first across a stretch of stump-dotted wet land with pools and rounded rises, green new grass, and trickling streamlets of recently-melted snow. Then came a fringe of scrub growth woven into an almost impenetrable tangle—oaks, popples, willows, cedar, tamarack—and through it all an abatis of old slashing, with its rotting, fallen stumps, its network of tops, its soggy root-holes, its fallen, uprooted trees. Along one of these strutted a partridge. It clucked at Bob, but refused to move faster, lifting its feet deliberately and spreading its fan-like tail. The River Trail here took to poles laid on rough horses. The poles were old and slippery, and none too large. Bob had to walk circumspectly to stay on them at all. Shortly, however, he stepped off into the higher country of the hardwoods. Here the spring had passed, scattering her fresh green. The tops of the trees were already in half-leaf; the lower branches just budding, so that it seemed the sowing must have been from above. Last year's leaves, softened and packed by the snow, covered the ground with an indescribably beautiful and noiseless carpet. Through it pushed the early blossoms of the hepatica. Grackles whistled clearly. Distant redwings gave their celebrated imitation of a great multitude. Bluebirds warbled on the wing. The busier chickadees and creepers searched the twigs and trunks, interpolating occasional remarks. The sun slanted through the forest.

Bob strode on vigorously. His consciousness received these things gratefully, and yet he was more occupied with a sense of physical joy and harmony with the world out-of-doors than with an analysis of its components. At one point, however, he paused. The hardwoods had risen over a low hill. Now they opened to show a framed picture of the river, distant and below. In contrast to the modulated browns of the tree-trunks, the new green and lilac of the undergrowth and the far-off hills across the way, it showed like a patch of burnished blue steel. Logs floated across the vista, singly, in scattered groups, in masses. Again the river was clear. While Bob watched, a man floated into view. He was standing bolt upright and at ease on a log so small that the water lapped over its top. From this distance Bob could but just make it out. The man leaned carelessly on his peavey. Across the vista he floated, graceful and motionless, on his way from the driving-camp to the mill.

Bob gave a whistle of admiration and walked on.

"I wish some of our oarsmen could see that," he said to himself. "They're always guying the fellows that tip over their cranky little shells."

He stopped short.

"I couldn't do it!" he cried aloud, "nor I couldn't learn to do it. I sure *am* a dub!"

He trudged on, his spirits again at the ebb. The brightness of the day had dimmed. Indeed, physically, a change had taken place. Over the sun, banked clouds had drawn. With the disappearance of the sunlight a little breeze, before but a pleasant and wandering companion to the birds, became cold and draughty. The leaf-carpet proved to be soggy, and as for the birds themselves, their whistles suddenly became plaintive as though with the portent of late autumn.

This sudden transformation, usual enough with every passing cloud in the childhood of the spring, reacted still farther on Bob's spirits. He trudged doggedly on. After a time a gleam of water caught his attention to the left. He deserted the River Trail, descended a slope, pushed his way through a thicket of tamaracks growing out from wire-grass and puddles, and found himself on the shores of a round lake.

It was a small body of water, completely surrounded by tall, dead, brown grasses. These were, in turn, fringed by melancholy tamaracks. The water was dark-slate color, and ruffled angrily by the breeze which here in the open, developed some slight strength. It reminded Bob of a "bottomless" lake, pointed out many years before to his childish credulity. A lonesome hell-diver flipped down out of sight as Bob appeared.

The wet ground swayed and bent alarmingly under his tread. A stub attracted him. He perched on the end of it, his feet suspended above the wet, and abandoned himself to reflection. The lonesome diver reappeared. The breeze rustled the dead grasses and the tamaracks until they seemed to be shivering in the cold.

Bob was facing himself squarely. This was his first grapple with the world outside. To his direct American mind the problem was simple in the extreme. An idler was a contemptible being. A rich idler was almost beneath contempt. A man's life lay in activity. Activity, outside the artistic and professional, meant the world of business. All teaching at home and through the homiletic magazines, fashionable at that period, pointed out but one road to success in this world—the beginning at the bottom, as Bob was doing, close application, accuracy, frugality, honesty, fair dealing. The homiletic magazines omitted idealism and imagination; but perhaps those qualities are so common in what some people are pleased to call our humdrum modern business life that they were taken for granted. If a young man could not succeed in this world, something was wrong with him. Can Bob be blamed that, in this baffling and unsuspected incapacity, he found a great humility of spirit? In his fashion he began to remember trifling significances which, at the time, had meant little to him. Thus, a girl had once told him, half-seriously:

"Yes, you're a nice boy, just as everybody tells you; a nice, big, blundering, stupid, Newfoundland-dog boy."

He had laughed good-humoredly and had forgotten. Now he caught at one word of it. That might explain it—he was just plain stupid! And stupid boys either played polo or drove fancy horses or ran yachts—or occupied ornamental—too ornamental—desks for an hour or so a day. Bob remembered how, as a small boy, he used to hold the ends of the reins under the delighted belief that he was driving his father's spirited pair.

"I've outgrown holding the reins, thank you," he said aloud in disgust. At the sound of his voice the diver disappeared. Bob laughed and felt a trifle better.

He reviewed himself dispassionately. He could not but admit that he had tried hard enough, and that he had courage. It was just a case of limitation. Bob for the first time bumped against the stone wall that hems us in on all sides—save toward the sky.

He fell into a profound discouragement—a discouragement that somehow found its prototype in the mournful little lake with its leaden water, its cold breeze, its whispering dried marsh grasses, its funereal tamaracks, and its lonesome diver.

X

BUT Bob was no quitter. The next morning he tramped down to the office animated by a new courage. Even stupid boys learned, he remembered. It took longer, of course, and more application. But he was strong and determined.

He remembered Fatty Hayes who took four years to make the team—Fatty who couldn't get a signal through his head until about time for the next play, and whose great body moved only appreciable seconds after his brain had commanded it—Fatty Hayes, the "scrub's" chopping-block for trying out new men on! And yet he did make the team in his senior year. Bob acknowledged him a very good center, not brilliant, but utterly sure and safe.

Full of this dogged spirit he tackled the day's work. It was a heavy day's work. The mill was just hitting its stride, the tall ships were being laden and sent away to the four winds, buyers the country over were finishing their contracts. Collins, his coat off, his sleeve-protectors strapped closely about his thin arms, worked at an intense white heat. He wasted not a second of time, nor did he permit discursive interruption. His manner to those who entered the office was civil but curt. Time was now the essence of the contract these men had with life.

About ten o'clock he turned from a swift contemplation of the tally-board.

"Orde!" said he sharply.

Bob disentangled himself from his chair.

"Look there," said the bookkeeper, pointing a long and nervous finger at three of the tags he held in his hand. "There's three errors." He held out for inspection the original scaler's report which he had dug out of the files.

Bob looked at the discrepant figures with amazement. He had checked the tags over twice, and both times the error had escaped his notice. His mind, self-hypnotized, had passed them over in the same old fashion. Yet he had taken especial pains with that list.

"I happened, just happened, to check these back myself," Collins was saying rapidly. "If I hadn't, we'd have made that contract with Robinson on the basis of what these tags show. We haven't got that much seasoned uppers. Nor anything like it, if you've made many more breaks like this. If we'd contracted with Robinson for what we haven't got or couldn't get, we'd be in a nice mess—and so would Robinson!"

"I'm sorry," murmured Bob, "I'll try to do better."

"Won't do," said Collins briefly, "You aren't big enough for the job. I can't get behind, checking over your work. This office is too rushed as it is. Can't fool with blundering stupidity."

Bob flushed at the word.

"I guess you'd better take your time," went on Collins. "You may be all right for all I know, but I haven't got time to find out."

He rang a bell twice and snatched down the telephone-receiver.

"Hullo, yards, send up Tommy Gould to the office. I want him to help me. I don't give a damn for the scaling. You'll have to get along somehow. The five of you ought to hold that down. Send up Gould, anyhow." He slammed up the receiver, muttering something about incompetence. Bob, for a moment, had a strong impulse to retort, but his anger died. He saw that Collins was not, for the moment, thinking of him at all as a human being, as a personality—only as a piece of this great swiftly-moving machine that would not run smoothly. The fact that he had come under Fox's convoy evidently meant nothing to the little bookkeeper, at least for the moment. Collins was entirely accustomed to hiring and discharging men. When transplanted to the frontier industries, even such automatic jobs as bookkeeping take on new duties and responsibilities.

Bob, after a moment of irresolution, reached for his hat.

"That will be all, then?" he asked.

Collins came out of the abstraction into which he had fallen.

"Oh—yes," he said, "sorry, but of course we can't take chances on these things being right."

"Of course not," said Bob steadily.

"You just need more training," went on Collins, with some vague idea of being kind to this helpless, attractive young fellow. "I learned under Harry Thorpe that results is all a man looks at in this business."

"I guess that's right," said Bob. "Good-bye."

"Good-bye," said Collins over his shoulder. Already he was lost in the rapid computations and calculations that filled his hours.

XI

BOB left the office and tramped blindly out of town. His feet naturally led him to the River Trail. Where the path finally came out on the banks of the river, he sat down and delivered himself over to the gloomiest of reflections.

He was aroused finally by a hearty greeting from behind him. He turned without haste, surprise or pleasure to examine the newcomer. He saw surveying him, a man well above sixty, heavy bodied, burly, big, with a square face, heavy jowled and homely, with deep blue eyes set far apart, and iron-gray hair that curled at the ends. With the quick, instinctive sizing-up developed on the athletic field, Bob thought him coarse-fibered, jolly, a little obtuse, but strong—very strong—with the strength of competent effectiveness. He was dressed in a slouch hat, a flannel shirt, a wrinkled old business suit, and mud-splashed, laced half-boots.

"Well, bub," said this man, "enjoying the scenery?"

"Yes," said Bob, with reserve. He was in no mood for casual conversation, but the stranger went on cheerfully.

"Like it pretty well myself, hereabouts." He filled and lighted a pipe. "This is a good time of year for the woods—no mosquitos, pretty warm, mighty nice overhead. Can't say so much for underfoot." He lifted and surveyed one foot comically, and Bob noticed that his shoes were not armed with the riverman's long, sharpened spikes. "Pretty good hunting here in the fall, and fishing later. Not much now. Up here to look around a little?"

"No, not quite," said Bob vaguely.

"This ain't much of a pleasure resort, and a stranger's a pretty unusual thing," said the big man, by way of half-apology for his curiosity. "Up buying, I suppose—or maybe, selling?"

Bob looked up with a beginning of resentment against this apparent intrusion on his private affairs. He met the good-humored, jolly eyes. In spite of himself, he half-smiled.

"Not that, either," said he.

"You aren't in the company's employ?" persisted the stranger, with an undercurrent of huge delight in his tone, as though he were playing a game that he enjoyed.

Bob threw back his head and laughed. It was a short laugh and a bitter one.

"No," said he, shortly, "—not now. I've just been fired."

The big man promptly dropped down beside him on the log.

"Don't say!" he cried. "What's the matter?"

"The matter is that I'm no good," said Bob evenly, and without the slightest note of complaint.

"Tell me about it?" suggested the big man soberly, after a moment. "I'm pretty close to Fox. Perhaps—"

"It isn't a case of pull," Bob interrupted him pleasantly, "It's a case of total incompetence."

"That's a rather large order for a husky boy like you," said the older man, with a sudden return to his undertone of bantering jollity.

"Well, I've filled it," said Bob, "That's the one job I've done good and plenty."

"Haven't stolen the stove, have you?"

"Might better. It couldn't be any hotter than Collins."

The stranger chuckled.

"He *is* a peppery little cuss," was his comment. "What did you do to him?"

Bob told him, lightly, as though the affair might be considered humorous. The stranger became grave.

"That all?" he inquired.

Bob self-disgust overpowered him.

"No," said he, "not by a long shot." In brief sentences he told of his whole experience since entering the business world. When he had finished, his companion puffed away for several moments in silence.

"Well, what are you going to do about it?" he asked.

"I don't know," Bob confessed. "I've got to tell father I'm no good. That is the only thing I can see ahead to now. It will break him all up, and I don't blame him. Father is too good a man himself not to feel this sort of a thing."

"I see," said the stranger. "Well, it may come out in the wash," he concluded vaguely after a moment. Bob stared out at the river, lost in the gloomy thoughts his last speech had evoked. The stranger improved the opportunity to look the young man over critically from head to foot.

"I see you're a college man," said he, indicating Bob's fraternity pin.

"Yes," replied the young man, listlessly, "I went to the university."

"That so!" said the stranger, "well, you're ahead of me. I never got even to graduate at the high school."

"Am I?" said Bob.

"What did you do at college?" inquired the big man.

"Oh, usual classical course, Greek, Latin, Pol ec—"

"I don't mean what you learned. What did you *do?*"

Bob reflected.

"I don't believe I did a single earthly thing except play a little football," he confessed.

"Oh, you played football, did you. That's a great game! I'd rather see a good game of football than a snake fight. Make the 'varsity?"

"Yes."

"Where did you play?"

"Half-back."

"Pretty heavy for a 'half,' ain't you?"

"Well—I trained down a little—and I managed to get around."

"Play all four years?"

"Yes."

"Like it?"

Bob's eye lit up. "Yes!" he cried. Then his face fell. "Too much, I guess," he added sadly.

For the first time the twinkle in the stranger's eye found vocal expression. He chuckled. It was a good, jolly, subterranean chuckle from deep in his throat, and it shook all his round body to its foundations.

"Who bossed you?" he asked, "—your captain, I mean. What sort of a fellow was he? Did you get along with him all right?"

"Had to," Bob grinned wryly, "you see they happened to make me captain."

"Oh, they happened to, did they. What is your name?"

"Orde."

The stranger gurgled again.

"You're just out then. You must have captained those big scoring teams."

"They were good teams. I was lucky," said Bob.

"Didn't I see by the papers that you went back to coach last fall?"

"Yes."

"I've been away and couldn't keep tab. How did you come out?"

"Pretty well."

"Win all your games?"

"Yes."

"That's good. Thought you were going to have a hard row to hoe. Before I went away the papers said most of the old men had graduated and the material was very poor. How did you work it?"

"The material was all right," Bob returned, relaxing a trifle in the interest of this discussion. "It was only a little raw, and needed shaking into shape."

"And you did the shaking."

"I suppose so; but you see it didn't amount to much because I'd had a lot of experience in being captain."

The stranger chuckled one of his jolly subterranean chuckles again. He arose to his feet.

"Well, I've got to get along to town," said he.

"I'll trot along too," said Bob.

They tramped back in silence by the River Trail. On the pole-trail across the swamp the stranger walked with a graceful and assured ease in spite of his apparently unwieldy build. As the two entered one of the sawdust-covered streets, they were hailed by Jim Mason.

"Why, Mr. Welton!" he cried, "when did you get in and where did you come from?"

"Just now, Jim," Welton answered. "Dropped off at the tank and walked down to see how the river work was coming on."

XII

TOWARD dusk Welton entered the boarding-house where Bob was sitting rather gloomily by the central stove. The big man plumped himself down into a protesting chair and took off his slouch hat. Bob saw his low, square forehead with the peculiar hair, black and gray in streaks, curling at the ends.

"Why don't you take a little trip with me up to the Cedar Branch?" he asked Bob, without preamble. "No use your going home right now. Your family's in Washington, and will be for a month or so yet."

Bob thought it over.

"Believe I will," he decided, at last.

"Do so!" cried Welton heartily. "Might as well see a little of the life. Don't suppose you ever went on drive with your dad when you were a kid?"

"No," said Bob, "I used to go up to the booms with him—I remember them very well; but we moved up to Redding before I was old enough to get about much."

Welton nodded his great head.

"Good old days," he commented, "and let me tell you, your dad was one of the best of 'em. Jack Orde is a name you can scare fresh young rivermen with yet," he added with a laugh. "Well, pack your turkey to-night—we'll take the early train to-morrow."

That evening Bob laid out what he intended to take with him, and was just about to stuff it into a pair of canvas bags when Tommy Gould, the youngest scaler, pushed open the door.

"Hello!" he smiled engagingly, "where are you going? Been transferred from the office?"

"On drive," said Bob, diplomatically ignoring the last question.

Tommy sat down on the edge of the bed and laughed until he was weak. Bob stared at him.

"Is there anything funny?" he inquired, at last.

"Did you say on drive?" inquired Tommy feebly.

"Certainly."

"With that?" Tommy pointed a wavering finger at the pile of duffle.

"What's the matter with it?" inquired Bob, a trifle uncertainly.

"Oh, *it's* all right. Only wait 'till Roaring Dick sees it. I'd like to see his face."

"Look here, Tommy," said Bob, with decision, "this isn't fair. I've never been on drive before, and you know it. Now tell me what's wrong or I'll wring your fool neck."

"You can't take all that stuff," Tommy explained, wiping his eyes, "Why, if everybody had all that mess, how do you suppose it would be carried?"

"I've only got the barest necessities," objected Bob.

"Spread out your pile," Tommy commanded. "There. Take those. Now, forget the rest."

Bob surveyed the single change of underwear and the extra socks with comical dismay. Next morning, when he joined Welton, he discovered that individual carrying a toothbrush in his vest-pocket and a pair of woolen socks stuffed in his coat. These, and a sweater, were his only baggage. Bob's "turkey," modest as it was, seemed to represent effete luxury in comparison.

"How long will this take?" he asked.

"The drive? About three weeks," Welton told him. "You'd better stay and see it. It isn't much of a drive compared with the old days; but in a very few years there won't be any drives at all."

At the end of twenty minutes the train came to a stop. Bob and Welton descended. The train moved on, leaving them standing by the track.

The remains of the forest, overgrown with scrub-oak and popple thickets pushed down to the right of way. A road, deep with mud and water, beginning at this point, plunged into the wilderness. That was all.

Welton thrust his hands in his pockets and splashed cheerfully into the ankle-deep mud. Bob shouldered his little bag and followed. Somehow, he had vaguely expected some sort of conveyance.

"How far is it?" he asked.

"Oh, ten or twelve miles," said Welton.

Bob experienced a glow of gratitude to the blithe Tommy Gould. What would he have done with that baggage out here in this lonesome wilderness of unbroken barrens and mud?

The day was beautiful, but the sun—breaking through the skin of last night's freezing—softened the ground until the going was literally ankle-deep in slush. Welton, despite his weight, tramped along cheerfully in the apparently careless indifference of the skilled woods-walker. Bob followed, but he used more energy. He was infinitely the older man's superior in muscle and endurance, yet he realized, with respect and admiration, that in a long or difficult day's tramp through the woods, Welton would probably hold him step for step.

The road wound and changed direction entirely according to expedient. It was a "tote road," merely cutting across these barrens by the directest possible route. Deep mire holes, roots of trees, an infrequent boulder, puddles and cruel ruts diversified the way. Occasional teeth-rattling stretches of "corduroy" led through a swamp.

"I don't see how a team can haul a load over this!" Bob voiced his marvel after a time.

"It don't," said Welton. "The supplies are all hauled while the ground is frozen. A man goes by hand now."

In the swamps and bottom-lands it was a case of slip, slide and wallow. The going was trying on muscle and mind. To right and left stretched mazes of white popples and willows tangled with old berry vines and the abatis of the slashings. Water stood everywhere. To traverse that swamp a man would have to force his way by main strength through the thick growth, would

have to balance on half-rotted trunks of trees, wade and stumble through pools of varying depths, crawl beneath or climb over all sorts of obstructions in the shape of up-roots, spiky new growths, and old tree-trunks. If he had a gun in his hands, he would, furthermore, be compelled, through all the vicissitudes of making his way, to hold it always at the balance ready for the snap-shot. For a ruffled grouse is wary, and flies like a bullet for speed, and is up and gone almost before the roar of its wings has aroused the echoes. Through that veil of branches a man must shoot quickly, instinctively, from any one of the many positions in which the chance of the moment may have caught him. Bob knew all about this sort of country, and his pulses quickened to the call of it.

"Many partridges?" he asked.

"Lots," replied Welton, "but the country's too confounded big to hunt them in. Like to hunt?"

"Nothing better," said Bob.

After a time the road climbed out of the swamp into the hardwoods, full of warmth and light and new young green and the voices of many creatures, with the soft, silent carpet of last autumn's brown, the tiny patches of melting snow, and the pools with dead leaves sunk in them and clear surfaces over which was mirrored the flight of birds.

Welton puffed along steadily. He did not appear to talk much, and yet the sum of his information was considerable.

"That road," he said, pointing to a dim track, "goes down to Thompson's. He's a settler. Lives on a little lake."

"There's a deer," he continued, "over in that thicket against the hill."

Bob looked closely, but could see nothing until the animal bounded away, waving the white flag of its tail.

"Settlers up here are a confounded nuisance," went on Welton, after a while. "They're always hollering for what they call their 'rights.' That generally means they try to hang up our drive. The average mossback's a hard customer. I'd rather try to drive nails in a snowbank than tackle driving logs through a farm country. They never realize that we haven't got time to talk it all out for a few weeks. There's one old cuss now that's making us trouble about the water. Don't want to open up to give us a fair run through the sluices of his dam. Don't seem to realize that when we start to go out, we've got to go out in a *hurry* spite o' hell and low water."

He went on, in his good-natured, unexcited fashion, to inveigh against the obstinacy of any and all mossbacks. There was no bitterness in it, merely a marvel over an inexplicable, natural phenomenon.

"Suppose you *didn't* get all the logs out this year?" asked Bob, at length, "Of course it would be a nuisance, but couldn't you get them next year?"

"That's the trouble," Welton explained. "If you leave them over the summer, borers get into them, and they're about a total loss. No, my son, when you start to take out logs in this country, you've got to *take them out!*

"That's what I'm going in here for now," he explained, after a moment. "This Cedar Branch is an odd job we had to take over from another firm. It is an unimproved river, and difficult to drive, and just lined with mossbacks. The crew is a mixed bunch—some old men, some young toughs. They're a hard crowd, and not one like the men on the main drive. It really needs either Tally or me up here; but we can't get away for this little proposition. He's got Darrell in charge. Darrell's a good man on a big job. Then he feels his responsibility, keeps sober and drives his men well. But I'm scared he won't take this little drive serious. If he gets one drink in him, it's all off!"

"I shouldn't think it would pay to put such a man in charge," said Bob, more as the most obvious remark than from any knowledge or conviction.

"Wouldn't you," Welton's eyes twinkled. "Well, son, after you've knocked around a while you'll find that every man is good for something somewhere. Only you can't put a square peg in a round hole."

"How much longer will the high water last?" asked Bob.

"Hard to say."

"Well, I hope you get the logs out," Bob ventured.

"Sure, we'll get them out!" replied Welton confidently, "we'll get them out if we have to go spit in the creek!"

With which remark the subject was considered closed.

About four o'clock of the afternoon they came out on a low bluff overlooking a bottom-land through which flowed a little stream twenty-five or thirty feet across.

"That's the Cedar Branch," said Welton, "and I reckon that's one of the camps up where you see that smoke."

They deserted the road and made their way through a fringe of thin brush to the smoke. Bob saw two big tents, a smouldering fire surrounded by high frames on which hung a few drying clothes, a rough table and a cooking fire over which bubbled tremendous kettles and fifty-pound lard-tins suspended from a rack. A man sat on a cracker-box reading a fragment of newspaper. A boy of sixteen squatted by the fire.

This man looked up and nodded as Welton and his companion approached.

"Where's the drive, doctor?" asked the lumberman.

"This is the jam-camp," replied the cook. "The jam's upstream a mile or so. Rear's back by Thompson's somewheres."

"Is there a jam in the river?" asked Bob with interest. "I'd like to see it."

"There's a dozen a day, probably," replied Welton, "but in this case he just means the head of the drive. We call that the 'jam.' "

"I suppose Darrell's at the rear?" Welton asked the cook.

"Yep," replied that individual, rising to peer into one of his cavernous cooking utensils.

"Who's in charge here?"

"Larsen."

"H'm," said Welton, "Well," he added to himself, "he's slow, safe and sure, anyway."

He led the way to one of the tents and pulled aside the flap. The ground inside was covered by a welter of tumbled blankets and clothes.

"Nice, tidy housekeeping," he grinned at Bob. He picked out two of the best blankets and took them outside, where he hung them on a bush and beat them vigorously.

"There," he concluded, "now they're ours."

"What about the fellows who had 'em before?" inquired Bob.

"They probably had about eight apiece—and if they hadn't they can bunk together." Bob walked to the edge of the stream. It was not very wide, yet at this point it carried from three to six or eight feet of water, according to the bottom. A few logs were stranded along shore. Two or three more floated by, the forerunners of the drive. Bob could see where the highest water had flung debris among the bushes, and by that he knew that the stream must be already dropping from its freshet.

It was now late in the afternoon. The sun dipped behind a cold and austere hill-line. Against the sky showed a fringe of delicate popples, like spray frozen in the rise. The heavens near the horizon were a cold, pale-yellow of unguessed lucent depths that shaded above into an equally cold, pale-green. Bob thrust his hands in his pockets and turned back to where the drying-fire, its fuel replenished, was leaping across the gathering dusk.

Immediately after, the driving crews came tramping in from upstream. They paid no attention to the newcomers, but dove first for the tent then for the fire. There they began to pull off their lower garments, and Bob saw that most of them were drenched from the waist down. The drying-racks were soon steaming with wet clothes.

Welton fell into low conversation with an old man, straight and slender as a Norway pine, with blue eyes, flaxen hair, eyebrows and mustache. This was Larsen, in charge of the jam, honest, capable in his way, slow of speech, almost childlike of glance. After a few minutes Welton rejoined Bob.

"He's a square peg, all right," he muttered, more to himself than to his companion. "He's a good riverman, but he's no river-boss. Too easy going. Well, all he has to do is to direct the work, luckily. If anything really goes wrong, Darrell would be down in two jumps."

"Grub pile!" remarked the cook conversationally.

The men seized utensils from a heap of them and began to fill their plates from the kettles on the table.

"Come on, bub," said Welton, "dig in! It's a long time 'til breakfast!"

[TO BE CONTINUED]

The White House Wonder

A Tale of Easter Hats

By WILLIAM HAMILTON OSBORNE

DRAWINGS BY HAROLD SMITH

MR. JOHN JAMES MACKERley opened wide his eyes. Something had wakened him from deep slumber; he knew not what. He lay comfortably quiet, blinking into the gloom—this but for an instant. In the next instant he lay uncomfortably quiet; for suddenly he heard a sound; another—then another; the unmistakable noise of a human being groping stealthily about the room. Still Mr. Mackerley lay quiet. Not so his heart—that active organ was playing tag with its owner's epiglottis; varying the monotony with a dash at soccer and the national game. But as for Mr. Mackerley himself, it is to this day a matter between Mr. Mackerley and Mr. Mackerley's conscience as to whether Mr. Mackerley, on *that* occasion, in the circumstances, *could* have moved if he would, or *would* if he could. Mr. Mackerley's heart, however, having deserted sport and taken up a permanent position as a telegraph operator (using its proprietor's ribs to practice on) flashed this little message north to Mr. Mackerley's brain:

"A burglar, by gum. Help."

Whereupon Mr. Mackerley closed his eyes and shivered. He kept them closed until he felt, rather than heard—so stealthily did the interloper work—that his clothes upon the chair at his bedside were being tampered with. This, Mr. Mackerley reasoned with himself, was fast assuming the proportions of a personal matter and—in spite of the fact that his heart was now operating a riveting-machine—Mr. Mackerley once more opened wide his eyes. As he did so fear deserted him—he became a lion, a marvel of masculine courage.

"A woman burglar. Humph," he reasoned calmly with himself. He waited for a moment to permit the culprit almost to complete her task—then he bounded out

of bed and clutched the female marauder fiercely by the arm. She screamed.

"It's *you*, is it," commented John James Mackerley, "y'ought to be ashamed of yourself. Stealin' money off of me. My wife."

"I—I wasn't goin' to steal money off of you, Johnnie," wailed his better-half, "I only—"

"I have heard of such things," went on John James, in an injured tone, "I have read about such things in the comic papers. But I never thought I'd live to *see* such things. My wife—a-hookin' cash out of my clothes."

"I didn't hook no cash," she whimpered.

"Of course you didn't," returned John James, "good reason. There wasn't none there. How could you have hooked it when I didn't have none. Eh?"

"That's what I wanted to find out. I wasn't going to hook none," returned the lady, "even if I'd found it. I wanted to find was you tellin' me the truth when you said you hadn't none last night. That's all."

"You doubted my word?" queried her lord and master.

"I didn't doubt your word, Johnnie," she replied, "only I wanted to find out the truth."

"Woman!" exclaimed Mr. Mackerley, thrusting her away from him, "you watch me. Look." He drew up the shade and admitted the light of early dawn into the room. Then he dragged his clothes to the window and turned the pockets—one by one—inside out. They were empty—void.

"Woman," went on Mackerley, "you go to bed and you keep sayin' over and over that there eighth commandment: Thou shalt not steal. Say it until you get it in your system."

"I wasn't goin' to steal—"

"You was doin' worse yet, then. To think that my wife—J. J. Mackerley's wife—his own flesh an' blood, couldn't believe him when he tells her that he hasn't got a soo, markee. What would Bill Prime say to this—Bill Prime, sleeping the sleep of the just up on the next floor, and never suspectin' that J. J. Mackerley's own wife give J. J. Mackerley the lie. By gum."

Whereupon, the morning dampness having tackled Mr. Mackerley in the region of the legs, he, too, retreated to his bed and immediately went to sleep, soothed by the certainty that he had "got it on" the old woman, or in a more refined tongue, had "come one over" her.

When he was fully dressed the next morning—a process that preceded his very brief ablutions—Mr. Mackerley very ostentatiously, and in the full sight of the missus, delicately lifted up the corner of the mattress, and took therefrom a slender but satisfying roll of bills. The eyes of the missus bulged.

"Oo-oh!" she exclaimed, in tones of reproach, "you *did* have some. You told me you didn't have none. And you *did!*"

Mr. Mackerley smiled a supercilious smile. He sat down on the edge of the bed, removed his shoe and dropped the roll of bills into it, and laced it up again. "Woman!" he exclaimed, "you have said it. You didn't trust J. J. Mackerley. So how could J. J. Mackerley trust you. That money," he explained, "is for honest, upright folks, and no one else. There's only one such in *this* flat," he added, tapping himself generously upon the chest.

Mrs. Mackerley wheedled. She held out her hand, palm uppermost. "Only a dollar forty-nine, Johnnie," she pleaded.

"Not a soo, markee," responded Johnnie, still nursing that comfortable idea that he had got it on her. But she clutched him by the sleeve.

"It's to save you money, Johnnie," she went on, "I can get it *now* at special—a dollar forty-nine. Two months more, come Easter, it'll cost two ninety-eight."

"Oh, no, it won't," remarked J. J. M., "it won't cost me not a soo. Not Easter, nor not any other time."

"But—" persisted the lady.

"Woman," he interrupted, "ain't this the same spiel you was givin' me last night—an' the night before—and all last week. Ain't it?"

She needed in despair. "Only a dollar forty-nine," she repeated, "if I get it now, an' I got to have a Easter hat."

J. J. M.'s proboscis snorted sarcasm in full measure. "So you got to have a Easter hat," he said. He plucked a derby from the bureau. "Woman," he went on, "look at this here tile. I've wore this for two year."

"I've wore mine for three—"

"Mebbee I'll wear this here tile for five," he went on.

"Men's hats is different," she protested.

"Is it *so?*" he ironically returned, "don't the papers advertise these here Easter hats

for men. Ain't there such a thing as styles for males? Ain't there grays, and browns, and flat crowns, and roll brims, and such? And what do I do? I ignore 'em. They can laugh at me, an' call me old-fashioned, but *I* wear *my* tile for five years at a lick. And *you* want one—a new one—at the end of three, and go feeling around in my clothes for the stuff to buy it with. And you a wife. For shame."

It was at Cutty Wortman's place that afternoon that J. J. M. unbosomed himself to Bill Prime—Bill Prime being the tenant of the third floor in the same house occupied by J. J. M.

"First and foremost, Bill," he started in, escorting Bill to a cozy table in the corner, "what'll it be?"

Bill, giving it as his opinion that anything would do, so long as it was strong enough and plenty of it, J. J. M. lifted up his voice in the direction of the bar.

"Set 'em up, Cutty," he directed, "and, by the way, Cutty," he added, as that gentleman waddled over to the table in the corner, "you've got a month's score chalked up against me, ain't you?" He drew forth his slender roll of bills. "I'm just the lad to square it up, right on the dot. How much is it, Cutty?"

Cutty waddled back and got his book and figured up, and then announced that five dollars and ten cents would be just about right, and there wasn't no blamed hurry about *that*, but of course he, Cutty, wasn't in the habit of refusin' good money if it was in anywise pushed *into* him. J. J. M. tossed over six dollars with the air of a man to whom cash was a burden.

"Cutty," he said, "gimme seventy-five cents change. You blow yourself on the extra fifteen. You buy yourself a good drink and a cigar, or a drink and a good cigar. And let it go at that." He stuffed his roll back into his pocket. He removed his derby.

"Bill," he said to Prime, looking first at his own hat and then at his friend's, "gettin' a bit rusty—a bit rusty, Bill. We need new tiles, we do."

Bill Prime nodded. "Tony says," he answered, "that he's going to put in a new stock of two-fifties for Easter that'll make your hair curl. I'm a-goin' to invest."

Mr. Mackerley lit an *extra* good cigar and tossed off a strong one and a long one in unison with Prime.

"And now," went on J. J. M., "about the wimmen. Let me tell you what tricks she's been up to. Just let me tell you about her."

It was some four weeks later that Mrs. John James Mackerley, of the second floor, caught sight of Mrs. William Prime, of the third floor, at the ribbon counter of the Green store. She sniffed suspiciously.

"Whatever be you gettin'?" she inquired.

Mrs. William Prime held a tight grip upon herself. "Just a quarter's worth o' ribbon," she replied.

"What for?" asked Mrs. Mackerley.

"For the rocking-chair," returned the other, "a bow on the back of the rocking-chair does liven up the room so much. Are you buyin' or just comin' in an' lookin' round?" she queried in her turn.

"Just after gettin' a twenty-three cent spray of artificials for the pink vase," admitted Mrs. Mackerley, "it's comin' Easter and pink flowers—even false ones—looks so nice in our pink vase. You can help me pick 'em out."

On their way out of the Green store, Mrs. Mackerley caught Mrs. Prime by the skirt—a clutching, agitated, nervous grip.

"Look at *these here*," she said.

These here occupied the most prominent display window in the whole Green store, and spread themselves bountifully within it. They were wonderful creations—white, pink, purple, red, green—all flowers and silk and sheen and shimmer—to say nothing of their size and shape. The eyes of Mrs. Prime bulged out with longing—the eyes of Mrs. Mackerley sank in with secret and almost uncontrollable despair. No Merry Widow or Charlotte Corday had ever moved her soul and torn her inner sensibilities as did this up-to-date display. She could scarcely tear her eyes from the pink one in the rear long enough to read the placard in the front:

THE WHITE HOUSE WONDER
INAUGURATION MODELS—SPRING, 1910
THE EXCLUSIVE GREEN STORE
EASTER SPECIAL AT
ONLY $5.98

"Ain't they grand?" sighed Mrs. William Prime, crushing her insignificant bundle of pink ribbon in her hand.

Then each particular peach became a pair

"That pink one," gasped Mrs. J. J. M., performing ditto with her twenty-three cent investment of artificial flowers.

"I—think—" went on Mrs. Prime, with great deliberation, "that I'll—take the purple one. I *think*."

"Cheap, too," sighed Mrs. Mackerley, "*only* five ninety-eight. *Some* Easter hats cost ten."

It was perhaps two days later that Mrs. Bill Prime descended from the third floor to the second. She did it noiselessly—for there was motive in her madness. She did not knock at the door of Mrs. Mackerley but walked boldly in. Mrs. Mackerley was seated at the window, a needle poised in air, an old and faded thing upon her lap. Her first impulse was to hide it, but action came too late. She flushed.

"Whatever be you doin'?" queried Mrs. Prime.

"I changed my mind about these here pink flowers," admitted Mrs. Mackerley, "I figured out it would be a waste to put 'em in the pink vase. I can put 'em there when I'm through with 'em. I thought I'd just sew 'em onto my hat." She lifted the thing to her head. "How does it look?" she asked.

The third floor lady inspected it from all sides. "It'll do right well to wear *until* you git your Easter one," she finally remarked. She hesitated for an instant.

"I'll show you *mine*," she said. She darted out and up the stairs, returning in an instant with a superannuated object that answered as the background for a twenty-five cent ribbon done into a bow.

"I felt the same about the rocking-chair as you did about your vase," she conceded. "Does it look good?" she queried.

She of the second floor sniffed. "I s'pose,"

she conceded, "that to wear about on the back streets—until—that purple one—" her voice faltered and trailed off. Her chin quivered. Her eyes filled with bitter tears.

"Ain't it 'bout time we quit this?" she queried, "you tell me true and I'll tell you true. Is that your Easter hat?"

Mrs. Prime answered this by asking another question. "Is that thing *yours?*"

Mrs. Mackerley gulped and nodded.

"Then *this* is mine," wailed Mrs. Prime, in turn, "an' I call it a tearin' down shame. Oh, I could shake them men."

The two-sided, two-voiced dissertation upon Prime and Mackerley proceeded for the next half-hour with vigor—was conducted with such enthusiasm on the second floor that the advent of the moving van in the street below passed totally unobserved. Suddenly, however, Mrs. Mackerley found herself peering out of the window.

"It's the vacant first," she whispered, "somebody's movin' in." Whereupon, regardless of tuberculosis, pneumonia—or new-money—or, in fact, no-money, as the neighborhood called it—or appendickitess—regardless of each and every consequence, the second story front window went up, and the second story head, and the third story head popped out of it, and stayed popped.

"An'—look at him," gasped Mrs. Mackerley, "with gloves, and such."

The object of her exclamation was Mr. Arthur Costello, who later turned out to be the new first floor. He was a rather fancy article—immaculate as to attire, dainty, genteel. He was debonair. He was calm. He stood about, one glove on, one glove off—directing everything, bossing everybody—doing nothing. Two men and a slatternly female did the heavy work.

"I wonder how many vans he's got?" asked the third floor of the second floor. They asked in vain. Long after the first van had departed, the heads remained in place, but without result. At last, Mrs. Prime came to her senses.

"Ninny!" she exclaimed, "why, that's *all* his furniture. He ain't got much for a man that looks like him," she added, "with gloves, and such."

"Listen," commanded Mrs. Mackerley, pointing to the floor below. The voice of command was ascending from the first floor—the voice of Mr. Costello, saying things, and doing nothing.

"We've got a bachelor department in the house," commented Mrs. Prime.

That night when Mackerley came home Mrs. Mackerley sidled coyly up to him.

"Do you know what Serena Prime is going to get for Easter?" she inquired.

"Can't say that I do?" returned J. J. M.

"A White House Wonder. A purple one. For $5.98. At the Green store. Here in town," gasped Mrs. Mackerley.

"You don't say," returned Mackerley, with undisguised calm and comfort in his tone.

Mackerley's wife quivered all over. "Can't I have one, *just* this year, Johnnie?" she pleaded.

Johnnie pondered. He glanced slyly at the ceiling. "You kin," he answered. His wife leaped for him to crush him in her gratified embrace. He shook her off. "I got the floor," he continued, "and I ain't finished. You *kin* have a White House Wonder—*when* Serena Prime gets one."

A concession which clearly involved some foreknowledge as to the likelihood of Bill Prime's wife ever getting any nearer to a White House Wonder than she was at that time. Whereupon J. J. M.'s wife wilted, and slumped back into the depths of dark despair.

"Johnnie," said Bill Prime next day, as they foregathered at Cutty's place around the corner, "have you seen that geezer on the first floor—with gloves. Ain't he the goods?"

The brow of Mackerley darkened. "It's a blamed shame, Bill," he said. "A honest man, or a couple o' honest men, lives all their lives in a respectable neighborhood, and is the pride of the place—you an' me, I mean—supportin' our families, treatin' our wives decent, and makin' a name for ourselves. And then, right on the heel of it, comes a bit of scaffoldin'—nothin' more—just a bit of scaffoldin', draped with twenty-seven dollars worth o' clothes—I'll bet he don't wear no underwear, Bill—I'll bet it's all outside—an' gloves. Ain't it a shame? He comes along—an' the hull neighborhood gets down on its marrow bones, an' where are we? Just over twenty-seven dollars' worth o' shoddy stuff, inside an' out. There's more talk about him than there was about the President, an' *you* know it. *Mister* Costello—the counter-jumper—eight a week as like as not. An' you an' me—masons, making mason's pay."

He puffed awhile. "Bill," he said, "what we need is new clothes."

"Aw," returned Bill, "new clothes, nothin'. It'll all blow over, Johnnie."

It didn't blow over. Every time Mister Costello went out, every time he came home, up went windows and out went heads—the eyes of the wimmen were on him. Costello certainly put up a good front—he was a pleasure to the vision, and he knew it. It was Mrs. Prime who made the first important discovery about him. She crept from the first floor into the second floor one afternoon.

"I just took my nerve with me, Mrs. Mac," she admitted, "an' I called on *her*—just for to see and know. She ain't no slavey. She's his *wife*."

"W-w-what!" exclaimed Mrs. J. J. M., "t'at frowsy thing—*his* wife? And him so spick an' span."

"She can't help bein' frowsy," explained Serena Prime, "she ain't got nothing *not* to be frowsy *with*. *You* saw them sticks of furniture come in—nothin' to 'em. And she's worse—not her, but her clothes—nothin' but rags. Her name's Emma. Why, we're queens 'longside o' her. She's cryin' down there now." Mrs. Prime shaded her mouth with her hand. "She seen them White House Wonders in the Green store."

"Pore thing!" exclaimed Mrs. J. J. M.

"Pore Emma," sighed Mrs. Prime, "let's go down agin, an' comfort her, the pore thing."

They comforted her. For hours they comforted her. Behind closed doors they comforted her—it was a secret session that they held—a conclave that crystallized itself into a climax. And the burden of its song was—*He*. He, in general. He, specialized. Prime, he—Mackerley, he—Costello, he—he, him, his. The afternoon wore on into the evening, and in the evening Mrs. Mackerley received J. J. M. with blazing eyes—Mrs. Prime received *hers* with a vicious shake of the head—and pore Emma Costello welcomed her with a superabundance of vituperative epithets—directed not at him, but others.

"Look at these here," she said

"The stuck-up Jezebels," pouted pore Emma, "how I hate 'em."

"Sich a vain proposition of a female, Bill," vouchsafed Mrs. Prime to *hers*.

"I never see such a excluded hussy in my life," remarked Mrs. J. J. M. to him.

"Who?" queried J. J. M. of his wife, "might you be referring to, Serena Prime?"

"I'm referring to the first floor," sniffed she, "she couldn't even speak to me, she couldn't." Which was quite true, inasmuch as it referred to one instant in the afternoon when pore Emma was considerably choked up with tears. "Just because her husband's got a good job and can buy her good clothes, and because she can make a cheap show," went on Mrs. Mackerley, now swerving from the narrow path of truth, "she thinks she's better than anybody else." Such was the conversation of the Mackerleys.

Upstairs, Bill Prime turned a mild eye upon Serena. "And who's the vain proposition of a female?" he asked. The eye of his helpmeet was not at all mild.

"That—Costello woman downstairs," snapped out Serena, "what do you think she says. Says you can never tell how much money a man has by the way *he* dresses; but you can by the way he dresses his *wife*. Says that's so. She read it in a magazine, Bill."

"How does she dress?" queried Bill, who's eye had never lighted on the female proposition in question.

Serena lifted up her hands in exaltation. "*Clothes!*" she exclaimed, ecstatically, "you ought to see 'em, Bill. The impertinent hussy." Some smattering of truth here, Mrs. Prime—and some pardonable prevarication. But it all goes. So much for the Primes.

On the first floor Mr. Arthur Costello pulled off his gloves and laid his trousers carefully away to keep them in crease—and turned to pore Emma. "Who are these Jezebels?" he asked, "and can't you hurry with the supper. You're slow as thunder."

"Them two upstairs," returned pore Emma, "tryin' to stick it into me about their *men*. Sayin' what *clothes* they buy 'em. Talkin' about Easter—an' White House Wonder hats—an' how their men was so crazy to have 'em dress well, and how it was talked about among the men here, how well they dressed, and how their men could dress like anything only they wanted to put it all on their wives' backs—oh, the cheap Jezebels upstairs," she concluded, pummeling the air, "they make me sick."

Of course, these are three private conversations. Multiply them into a continuous performance—drink them down with morning coffee, eat them with eggs, masticate them with pie, deglute and digest them.

"*She's* even going to get a White House Wonder," thus Mrs. Prime.

"*She's* going to squander five ninety-eight on a gaslight green one," thus J. J. M.'s better-half.

"I wish," complained pore Emma to Mr. Costello, "that they'd stop talking about them there White House Wonders. You'd think nobody c'd buy a White House Wonder but themselves. They certainly do make me sick. A pink one and a purple one. I hope there's poison in the pink and in the purple, and it makes *them* sick, I do."

A bit incompatible, ladies, with the demeanor of you all as you meet face to face—is this backbiting, but it seems to go.

"Bill," said Johnnie Mackerley to Prime, "this Costello fellow is a-gettin' on my nerves. Hanged if I would like to call his bluff. Hang it, you an' me is as good as him, ain't we?"

"The wimmen is certainly down on 'em," said Prime, "an' they certainly is upstarts, that chap and his wife—an' ours is vested rights. Let's call his bluff."

Mr. Arthur Costello, watching pore Emma iron his trousers one evening, snorted defiance. "Are them two dubs upstairs the only two dubs in the hull neighborhood?" he queried, "do *they* run things, I wonder. Say, look ahere, *you!*" he exclaimed angrily, "*what* is it that they're harpin' on—the White House what?"

"White House Wonders—at the Green store—five ninety-eight," gasped Emma.

"If they was two ninety-eight, I might think about it," returned her husband, "but five ninety-eight for somethin' for a woman is too much for me. I pass."

Mrs. Costello nodded her assent. "Crowin' over us," she said.

Mr. and Mrs. John James Mackerley put their heads together in the seclusion of their second-story flat.

"Now look ahere, Maria," said Mackerley, "what I do I do on principle. That Costello thinks he's the whole show—so *you* say an' so Prime says, an' so does his wife. Now this here is a matter of business. Can you git anything just as good as the White House Wonder?"

Mrs. Mackerley shook her head. "There ain't only one White House Wonder hat," she answered, "Five ninety-eight." And she added to herself, "I hope the pink one is still there."

"There's the cash," growled Mackerley, "it'll make me short as the devil, but take it. Understand?"

There was a gleam of triumph in the eye of her as she seized the money and started for the door, and Mackerley noted it and held her back.

"Have you been stringing me?" he queried, "*is* Costello's wife a-goin' to buy a White House Wonder. Don't you fool me, Maria."

"Costello's wife!" exclaimed Maria in scorn, "why, she can buy ten White House Wonder's if she wants to. All she's got to do is to say the word. Of course she's goin' to buy one—a gaslight green."

It was Easter Sunday morning. Mr. Bill Prime, starting from his third-floor flat, met Mr. Mackerley on the way down.

"Goin' to church?" he queried.

"I am, but I'm goin' to take a walk first," said Mr. Mackerley.

"Same here, Johnnie!" exclaimed Prime. They descended to the street, and who should come out of the first-floor flat but Mr. Arthur Costello. The three nodded to each other. Mr. Costello looked at Mr. Prime's new tile, Mr. Prime did the honors by Mr. Mackerley's pearl-gray top-piece, and Mr. Mackerley soberly contemplated the brown headgear of Mr. Costello. Then they all whipped out unsullied pairs of gloves and proceeded to put them on.

"Goin' for a walk, gentlemen?" queried Mr. Costello. They nodded. "Till the ladies is dressed for church"; and the three strolled about together. As they swung back again, Mr. Prime caught Mr. Mackerley by the arm.

"Look at these three peaches!" he exclaimed, "ain't they the three chorus girls that was in the first row at the "Midnight Maids," last night?"

"Looks like 'em," quoth Mackerley.

"Sorry now I've got to go to church," said Mr. Costello, eyeing the three peaches hard.

The three peaches came on up the street. One was a pink peach, one a purple peach, and one a gaslight greengage. They came nearer, nearer, nearer, until the three men could see the whites of their eyes. Then Mr. Costello gasped with surprise.

"Its our wimmin folks," he said.

He was quite right. The peaches came on—bowed, smiled, giggled—then each particular peach became a pair.

"It's wonderful what wonders them White House Wonders does with wimmen," remarked Mr. Mackerley, admiringly, ostentatiously smoothing out his gloves and brushing off his tile. "You look all right, girlie!" he exclaimed.

The three peaches all looked all right. They also looked into each other's eyes. And the thing that the one said to the other, and the other said to the third—each eye to eye—was this:

"*It worked.*"

As for the rest, the bells rang, the choirs sang, and the Easter lilies cast their fragrance through the air. It was Resurrection Day—but *not* the day of resurrected hats.

Shasta

To J. H., Jr.

By Herman Scheffauer

O giant whose casque is of silver the snow-elves have driven,
  Warder of northernmost frontiers that press on our realm,
Monarch whose scepter and crown the rash lightnings have riven,
  White pyramid heaved to the heavens which Time shall not whelm!

Thy forests are harps; let their chords lift up anthems to praise thee,
  The land in its leagues upon leagues is burning with bloom;
Tell us what power plutonic burst up from its caverns to raise thee
  And flung the green seas from thy head and made thee its tomb?

Time's wings beat about thee forever, and hoofs of the thunder—
  Only the hosts of the snow lie tented supreme on the height!
Thy crest is not reft of its glory nor the earth of her wonder,
  Nor the sun of its mark in the dawn, nor the stars in the night.

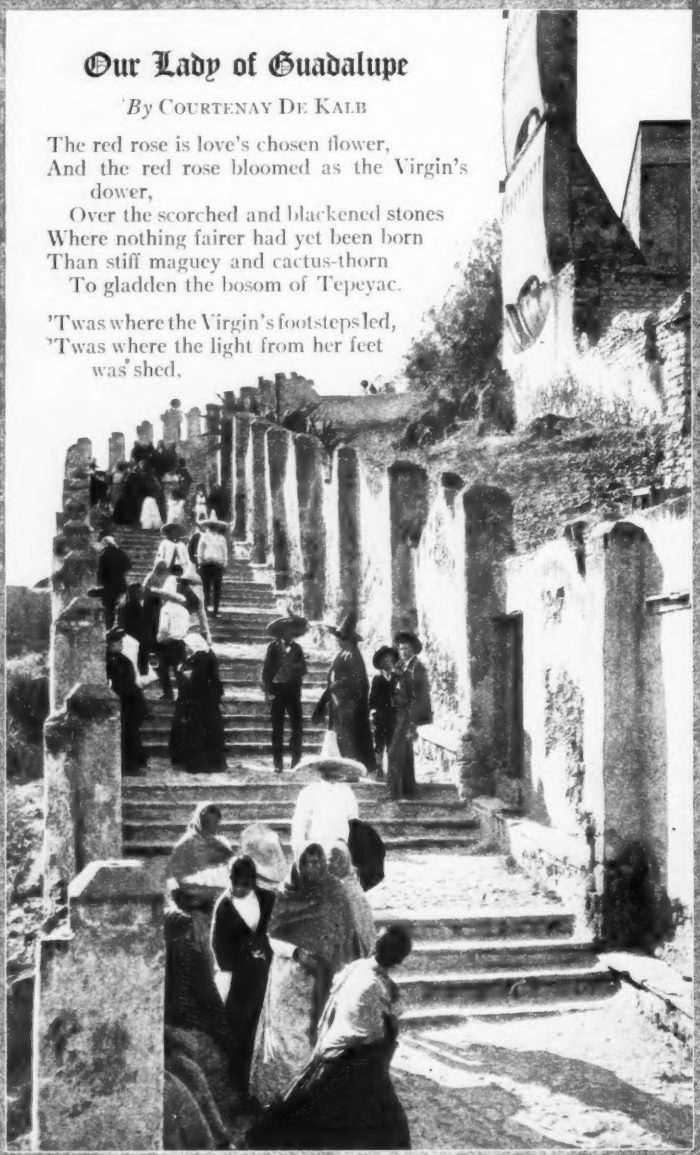
The clouds that bend over, and below the old world that is garnished
  With colors that perish—the seas that are raveled with storm—
These are but children of Change—thy summits hold luster untarnished,
  For Eternity lent thee its locks and the ages their form!

Our Lady of Guadalupe

By COURTENAY DE KALB

The red rose is love's chosen flower,
And the red rose bloomed as the Virgin's dower,
Over the scorched and blackened stones
Where nothing fairer had yet been born
Than stiff maguey and cactus-thorn
To gladden the bosom of Tepeyac.

'Twas where the Virgin's footsteps led,
'Twas where the light from her feet was shed,



The prisoned heart of the silent rock
Loosened in answering bloom to grace
A message of love to a bruised race,
From the barren hill of Tepeyac.

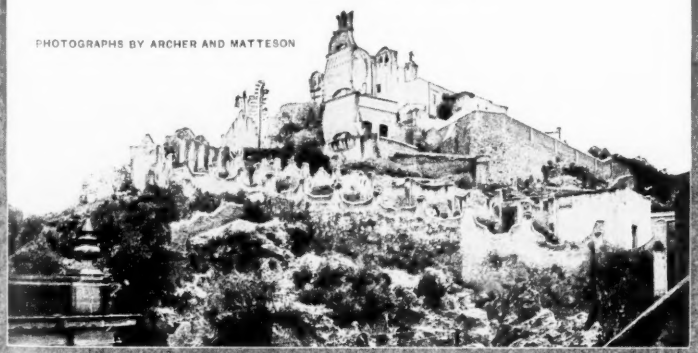
The garnered flowers in a tilma pressed
Close to a simple peon's breast,
Stirred every fiber in woof and warp
To catch from the vibrant perfume rare
The heavenly light and the features fair
Of the Virgin who stooped to Tepeyac.

For ages upon these stones did bleed
The sons of a dark and bitter creed,
Torn on the altars of cruel gods,
While prayer and sacrificial flame
Ascended in Tonantzin's name
For a mother's aid on Tepeyac.

Sweet faith sprung from that childhood hour
Of trust in a Madonna's power,
When round thee twined her sheltering arms!
To a woman's heart the weak, the brave,
Turn pleading a promise of love to save
The souls that cry from Tepeyac.

Behold, she has heard the piteous prayer!
The blooming roses her love declare,
And healing waters go singing there,
The holy hill it is brooding still
Over the wondrous miracle
Of Mary who came to Tepeyac.

PHOTOGRAPHS BY ARCHER AND MATTESON



The History of the American Cent

By FRANK A. LEACH

Late Director of the United States Mint, Washington, D. C.

PEOPLE passing through the San Francisco Mint during the past few months have been witnesses to a new coinage for this Coast—namely, the making of copper cents, and in quantities not measured by pounds, but by tons. That copper cents should become so much a part of the circulating medium of California and other parts of the Pacific Coast as to require a good part of the time and capacity of the local mint to supply the coins, is something that the coast business men of thirty or thirty-five years ago would have hardly dared to predict. At that period, even the five-cent piece was a despised coin, but time in the other changes wrought in business affairs and social conditions has produced a situation whereby big corporations with millions of capital invested solely depend upon the receipt of nickels, and nickels only, for its revenue and profit, and the copper cent, the smallest coin of our Government, is almost in general use. In the majority of the big retail stores and by many other business houses, the penny is given out and taken in making change. These thoughts carry the memory back to a still earlier date in California — in the Fifties — when dimes were the smallest coins in circulation and were valued little more, if any, then, than the pennies here now. In fact, in many places, the quarter-dollar piece was the smallest coin accepted. This was especially true of drug-stores where twenty-five cent purchases were the smallest that would be considered.

The first United States cent coined outside of the Philadelphia Mint, was struck at the San Francisco Mint, November 24, 1908. For many years—in fact, from the time the first mint was opened in 1793 until about five years ago—the law required all copper coins to be struck at the Philadelphia Mint. The necessity for coining the little coppers at the other mints became apparent fully ten years ago, but it took about five years' time to secure Congressional action in changing the law. The peculiarity of the law giving the monopoly of coinage to the Philadelphia institution was probably due to the original framing of the act at a time when there was only the one mint.

The San Francisco Mint made on its first run of cents 1,424,000 pieces; since then, up to the first of September last year, there has been coined there 860,000 additional pieces, or a total of 2,284,000 pieces, weighing seven tons and sixteen hundred pounds.

The following figures show how rapidly the use of the little coins has grown on the Pacific Coast in the last thirteen years, taking the amount supplied the public by the United States Subtreasurer at San Francisco as the standard of measurement. For the fiscal year ending June, 1897, the subtreasurer issued to the public: 452,200 pieces; fiscal year, 1900, 1,321,400 pieces; fiscal year, 1903, 1,576,500 pieces; fiscal year, 1909, 2,980,334 pieces.

Particular interest in the United States cent has been awakened throughout the entire country by reason of the recent radical change in the design of the coin. The new coin is popularly styled the "Lincoln Penny," for the reason that on the obverse side it bears a most excellent portrait of the great President.

The new cent is the first material change in design of this denomination of our coin

that has been made for forty-five years. When Congress established its first mint in 1792, the original coinage act provided that the copper cent should weigh 264 grains, but before any coins of this weight were struck, Congress found it desirable, in January of the next year, 1793, to reduce the weight of the cent to 208 grains. According to tradition in mint circles, copper bullion became worth in the neighborhood of thirty-five cents per pound at about this time, and as it only required 33.65 cent pieces to weigh a pound, the Treasury authorities were confronted with the fact that their new coins were worth more than their face value as bullion, and Congress was again required to reduce the weight of the cent to 168 grains each, which gave 41.66 pieces to the avoirdupois pound. This act placed the face value of the coins below the bullion value for the time being, but subsequently the price of copper advanced and people who wanted small amounts of copper for mechanical use found it more economical to melt up copper cents for the purpose than to purchase an equal weight of copper bullion. While search of the records fails to show any positive confirmation of this cause for the first reduction in size and weight of the coin, the records do show that for the first twenty-five years of the coinage of the coppers the cost of the metal to the Government averaged about thirty cents per pound —a fact which gives plausibility to the story, and probably there were periods during those twenty-five years when the price of the metal was considerable more than the coinage value.

The loss to the Government was greater by reason of the fact that up to sometime in the Forties the mint authorities had the blanks for the coins made in England and shipped to the mint at Philadelphia, where they were pressed and thus made into coins. After this time the blanks were made in the United States. President Tyler expressed himself in very decided language as being in favor of buying the copper for coinage in this country even if it cost more.

To obviate any further possibility of the loss of copper money in circulation by its being melted up for the metal, and the further desire to adopt a less weighty and more convenient coin in place of the old, bulky original copper cent, Congress, in February, 1857, authorized the reduction of the weight of the cent to 72 grains, and changed the character of the metal employed. Instead of being made of all copper, as before, the coins were now to consist of 88 per cent copper and 12 per cent nickel, and were known as the nickel cents. The diameter of the piece made this coin but a little smaller than the size of our present five-cent nickel, which was quite a change from the old coppers. There was also a radical change made in the design. The female head, labeled Liberty, was discarded for the flying eagle, being the same pose of the bird as was recently adopted by Mr. Saint-Gaudens for the new double-eagle, and the design of the reverse side was also changed. The coin was not favorably received. In fact, it was most severely criticised, but it was the only cent coin made at the mints for the next seven years, when the size, weight, metal and design were again changed by Congress.

Although the act making this change was not passed until 1864, the idea of the change was conceived over five years before, and the main features of the design of the little bronze cent which remained such a popular coin for forty-five years was made by the engraver in 1859. The weight of the coin was again materially reduced, this time to 48 grains. The reduction of the amount of metal made a corresponding reduction in the diameter and thickness of the piece, and, therefore, in a pound of metal there is now 146 pieces or cents. The use of the nickel was discarded, and the adoption of a composition for the coin of 95 per cent copper and 5 per cent zinc and tin, gave the pieces a bright bronze color when they came from the press, which fact, no doubt, contributed no small part to the popularity of the coin. No other coin of the United States, except the gold coins, has enjoyed so long a period of popularity without change of design. More than two generations have passed since the little penny of the "Indian Head" was first introduced to the people of the United States, a period long enough to throw some little air of mystery and tradition around the origin of the design; and the story which generally prevails and has so many times been printed as a fact and accepted in some quarters as undeniable, in all probability has contributed to some of the popularity of the coin with that class of people sentimentally inclined.

The story in substance is that while the head on the coin is decorated with feathers in imitation of an Indian Headdress, and has generally been called an Indian head; the profile is not that of a young Indian, but that of a young miss of Philadelphia, who afterwards achieved an enviable reputation for charitable and Christian work, and who died but quite recently.

About a year ago, or a little less, when the President contemplated authorizing a change in the design of the cent, so strong was the faith of some people in the truth of the above story, that the possibility of the so-called Indian head being discarded was startling to them, and the proposition was regarded as being an act akin to sacrilege or vandalism, and not a few letters and other remonstrances were sent into the Treasury Department and to the President.

A Baltimorian, who thought he knew all about the origin of the design, and who was much exercised over the proposed change, wrote to President Roosevelt, saying:

> The face on the penny is one of a pretty girl, who afterwards grew to be a famous woman. Her name was Sarah Longacre Keen, who lived in Philadelphia. When she was a child six years old, a delegation of Indians from the Northwest visited Washington to pay their respects to the Great White Father. After having spent considerable time at the Capital, they were taken to Philadelphia, and there were shown through the mint.
>
> Little Sarah's father was a fine engraver and he had official connection with this great money factory. He was a kindly, benevolent man as well, and invited the delegation of red-men to some sort of an entertainment at his home. One of the chiefs had his attention attracted to the little miss, and he was so much pleased with her figure and maidenly bearing that in a mood of sportiveness, he took off his headdress and put it on her head. She was not frightened, but lending herself to the enjoyment of the joke, she stood for a moment and let the company look at her.
>
> Someone present, who had both an eye for beauty and artistic skill, was so struck by the appearance little Sarah made in her Indian hat that he sketched her on the spot.
>
> The sketch was engraved by her father. Just then the one-cent coin in its present form was about to be issued, but the head with which its face was to be ornamented had not been chosen. This engraved sketch went into competition for the honor. It was accepted in preference to all others, and the imprint of it was transferred to the neat little copper coins which Uncle Sam for so many years has been sending out into the world.
>
> When Sarah grew into womanhood she became actively interested in missionary work, and was for thirty-five years Secretary of the Woman's Foreign Missionary Society of the Methodist Episcopal Church. She was also an earnest worker in the cause of higher education for women, and as a result of her efforts, there is a college for women in the City of Mexico dedicated to her memory and costing $100,000, most of which was given by her.

The Baltimorian, and the friends he represented, wanted the portrait of Miss Longacre Keen on the cent retained, declaring, "that the face was of one who accomplished much, and that it was not only more appropriate than a creation of an artist's imagination would be, but it was a tribute and an honor to American womanhood! As Sarah was in after life connected with mission work, it is certain that she too saw her face as a child many times in the missionary boxes she sent away to foreign fields."

The writer of this history of the American cent, having had some conversation with Charles E. Barber, who has been Chief Engraver and employe of the engraving department of the United States Mint at Philadelphia for forty years past, on the subject of the models for the heads of the designs of our coins, submitted this Baltimore statement to him, with a request for the facts as he knew them, and this is his very interesting reply:

> Regarding the story that has appeared in the newspapers of several cities of the United States relating to the head upon our bronze one-cent coin, I beg to say that it is most difficult to disprove a story of this character, and, in fact, many persons do not want any evidence to upset a pretty romance such as is now woven around this coin, any more than they are anxious for facts that will cast doubt upon the origin of our flag and the Betsy Ross romance. Nevertheless, such facts as I am in possession of I gladly give. Mr. Longacre was the engraver when the change in the one-cent piece was made. This was in 1859, and, undoubtedly, he made the change. What he used as a model for the head it is quite impossible for anyone at this late date to say, but we have in the mint evidence which, to my mind, is sufficient to satisfy any unprejudiced mind that he did not use either his daughter or an Indian war-bonnet.
>
> One of the gentlemen still in the mint, and who was assistant to Mr. Longacre, remembers very distinctly that Mr. Longacre's sentiments regarding portraits upon our coins were opposed to anything of this kind. It is also very clear in his mind that Mr. Longacre's aim was to portray what he considered an ideal head of an Indian female. This he gathered from many conversations upon this

subject. This much for the testimony of one who was assistant to Mr. Longacre.

We have also further facts which go to prove that Mr. Longacre did not use his daughter for his model—namely, in the original model, for the head upon the double-eagle executed by Mr. Longacre in 1840, we find precisely the same features as are upon the cent, only the feathers are omitted. Now, if the child was only six years old in 1859 when the cent was executed, she certainly was not used for the model of the head in 1849.

We also find the same head upon the three-dollar coin, with a change in the feathers; also, in another model for experimental coin with a sitting figure. In all these coins there is the same character of features, plainly proving to anyone familiar with the work of the engraver of coins, that, when called upon to produce a female Indian profile, Mr. Longacre had in mind and used his ideal, and never thought of making a portrait of anyone.

It appears to be incomprehensible to the majority of people not familiar with the work of the artist, that when he produces a head and face, whether male or female, that he has not the most remote idea of making a portrait, although he may have used a model. The culmination of his work is ideal.

We have heard it said many times, all of which is untrue, that the Longacre head upon the double-eagle was his wife's, that the head upon the standard dollar is that of a Philadelphia schoolteacher, that the head upon the new eagle is a portrait of an Irish girl in the employ of Mr. Saint-Gaudens. Although, Homer Saint-Gaudens, the artist's son, tells us the latter was a study for the Victory of the Sherman statue. (See *Century Magazine*, of March, 1908.) I may add that the feathers which decorate the head upon the one-cent coin are not a war-bonnet and, therefore, Mr. Longacre could never have sketched it from any real bonnet taken from the head of any Indian, as he was too good an artist to wander so far from the real thing.

It appears to me beyond all understanding how anyone can look at the features of the face upon the one-cent piece and think that they are those of a child six years old, or even a young girl.

Those who knew Mr. Longacre, and we who have his models before mentioned to study, have never for a moment considered the story concerning the head upon the one-cent piece anything more than an example of the fertility of the newspaper man's mind. If you ask for positive proof of this, there is none. Mr. Longacre died in 1869.

In 1905, when President Roosevelt conceived the idea of changing the design of the several coins of our country, the cent was one of the denominations selected for alteration and improvement, and the work of making the new design was turned over to Mr. Saint-Gaudens at the time he was given the contract for changing the designs of the gold coins, and Mr. Saint-Gaudens' first work after completing the design for the double-eagle, was making the models for the cent. He made a model of a female head adorned with an Indian feather headdress, much the same in general appearance as the head in use on the coin at that time. The change consisted of a more elaborate headdress and alterations in the features of the profile. When this model was presented to the President for his approval, he was so pleased with it that he decided to adopt it as the obverse side for the new ten-dollar piece. This changed the original plan of having the eagle, half-eagle and quarter-eagle made with the same design as that adopted for the double-eagle, and Mr. Saint-Gaudens, being feeble in health, all the time he was able to devote to the work of changing the designs was given to perfecting the models for both the double-eagle and eagle for practical mint operations, so that he finally passed away without making a new design for the cent.

After the completion of the alterations of the designs for the gold coins, Mr. Victor D. Brenner, of New York, one of the most skilful medalists this country has produced, was presented to the President with the request that he be given the commission to complete the work the President had in mind of changing the designs of the cent piece. As an outcome of this, Mr. Brenner was referred to me as Director of the Mint, and, after consultation with the artist, I instructed him, with the approval of Secretary Cortelyou, to prepare a model for the obverse side bearing a portrait of Lincoln. He was also given the law that should be followed in making the design for the reverse side. In due course of time, Mr. Brenner presented the models in accordance with these instructions, which met with the hearty approval of President Roosevelt and Secretary Cortelyou, and were formally adopted as the design for the new cent.

The fact that this change had been decided upon was given considerable publicity in the newspapers at the time, creating a very great interest in the public mind, and the appearance of the new coin was anxiously awaited. The Treasury Department was for a time, almost overwhelmed with applications for a supply of the new issue, coming from every part of the United States.

There was some little criticism emanating from those who feared that the use of the

head of the ex-president might establish a precedent which would lead to the ultimate adoption of the use of the portraits of existing executives on our coins, after the manner of monarchical governments. In this connection it may be of interest to cite the fact that the legislative act establishing the first mint of the United States and providing for a coinage system originated in the Senate. When the bill was sent to the House it contained the provision that the coins should exhibit on the face thereof the head or portrait of the President for the time being, with the numerical order of the presidency. When this act was considered in the House, no alteration of the bill was made except to strike out this clause and substitute the following: "An impression emblematic of Liberty, and an inscription of the word 'Liberty,' and the year of the coinage." What was intended in the law by the vague expression of "an impression emblematic of Liberty," has been generally interpreted through all these years by the use of a female head, sometimes adorned with the cap of Liberty, and at other times with an Indian headdress, but more frequently without any ornamentation other than a band above the brow holding the hair, bearing the word "Liberty." Some years ago this matter was made the subject of debate in the Senate, when Senator Morrill, of Vermont, said:

"The emblem of Liberty, like that of many other virtues, has been said to be always represented in petticoats. The Britannia of Great Britain appears in form like a near-relation to the Liberty, or the Minerva often found on old Greek and Roman coins, and in the days of Charles II, the Duchess of Richmond served as a model to the engraver; but, more recently, Victoria, by the distinguished medalist, Wyon, has been stamped with great excellence upon British coin, and she, like Queen Anne, seems to have occasionally insisted upon decent drapery about the bust.

"Our sitting emblem of Liberty on the fractional silver looks very like a descendent of our grandmother Britannia, by Clark Mills. Whether she wears long hair or a widow's cap may not be quite clear, and there is no end of crinoline, while the obtruding whalebones, in bas-relief, compressing the waist, painfully disclose overworn corsets. But, as our highest effort and best, on the copper cent and on the one-dollar and three-dollar gold coins, the head of our emblem appears in the baubles of an Indian princess, doubtless an ideal Pocahontas—That female bully of the town—with the head accordingly stuck around with feathers, and labeled on the tiara, 'Liberty.' Its circulation in the Indian Territory, I regret to say, has not been commensurate to the witchery of the bait. England strangely omits to stamp on her figure of the lion, 'this is a lion,' but our emblem, safe from all misconception, is always plainly and veraciously branded across the forehead, 'Liberty.' "

The use of the Liberty cap, which appears on some of the earliest coins of our country, was the subject of much discussion at periods, as to its appropriateness from 1793, when it was first used, up to sometime in the Thirties, when it was finally discarded. Its first use was on the cents of 1794, 1795, and a part of the year 1796, where it appears on the coin as if suspended in the air over the head of a female figure with flowing hair. It was not intended that this cap should appear as suspended in the air, but as being borne on a wand sustained on the shoulder of the figure and projecting backward. It was contended that the Liberty cap, or *pielus*, was in itself an emblem of Liberty, and should never be placed on the head of the figure, and that the emblem properly relates to a full-length figure of Liberty to be borne on a wand or staff sustained in her hand, and was out of place as an adornment or headdress.

Up to the year 1844, practically all of the copper used in the coinage of the cents came from foreign mines, and in that year they cost the Government about 32 cents per pound, and the average cost of the copper used for the first twenty years of the coinage of the copper cents was 30 cents per pound. In the fluctuations of the price of the metal there were times when the cost was equal to, or a little in excess of the face value of the coin. In 1844, President Tyler insisted that the product of the American copper-mine should be used in the coinage of the cents, and the first bid of the American producers was 40 cents per pound. This being 8 cents per pound more than the foreign metal could be purchased for, quite a controversy followed over the matter, which finally resulted in the contracts being given to the American producers at a reduction of price something below the

quotation for the foreign metal, and ever since then American copper has been almost exclusively used in making the cent coins.

In 1838, Dr. Louis Feuchtwanger memorialized Congress to adopt his invention called "German silver," a combination of copper, zinc and nickel, in place of the copper for the making of the cents. This proposition seems to have been seriously considered by Congress, but upon the representations and objections raised by the mint authorities, Dr. Feuchtwanger's proposition was rejected. The only other attempt to change the metal as used in this coinage is mentioned in a previous part of this article. Of the little bronze cent, the design of which has just been changed, it might be of interest to know that there has been made and placed in circulation 1,655,025,769 pieces, or over $16,550,000 worth. Perhaps the extent of this issue can be better comprehended by explaining that this amount would weigh 5,667 tons, or would make 188 carloads of 30 tons each.

The cost of the metal used in the coinage of one thousand dollars in cents is a little less than one-tenth of that amount, or $100, with copper at 13½ cents per pound. The outlay for labor in the manufacture of the coin, per one thousand dollars, is a little over one-tenth, or $100. So, on an average, Uncle Sam makes a seigniorage or profit of about $800 on each thousand dollars coined in cents.

To An Easter Lily

By Julia Boynton Green

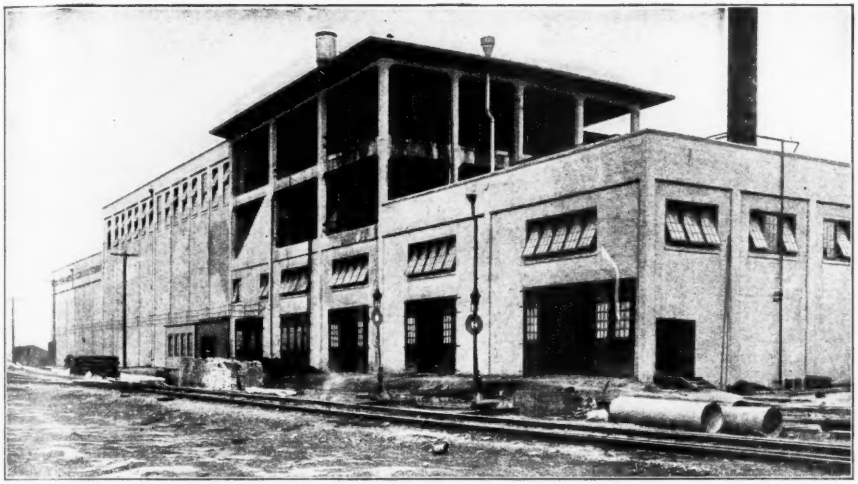
Whiteness and listening silence like a prayer
Topping the slender minaret of green
The great bells droop. I hush my breath and lean
Lest from those pearl-pure throats might stir the air
Some message, and my soul be unaware.
The stamens tremble mutely. Ah! I ween—
This heart of mine!—I cannot boast it clean
Enough the lily's confidence to share.

The rose's passion and the pansies' mirth,
The daisies' cheer—O darlings of the earth!
I, too, am earthy, I can take thy word.
But this white angel, whispering unheard,
Only the shriven rapture of a saint
Could win to break that heavenly restraint.

WAIT FOR THE WAGON

By Childe Harold

"I may be wrong," said Mr Lee,
"But for a boy of eight
Your little Waldron looks to me
A trifle under weight."



The large fruit pre-cooling plant at Roseville, California, comprising ice plant and temporary storage warehouses, and other details of the intermittent vacuum system controlled by L. A. Roy, of Chicago

What Pre-cooling Means

Treatment of California Fruit So It Will Reach Consumers Fresh From Tree or Vine

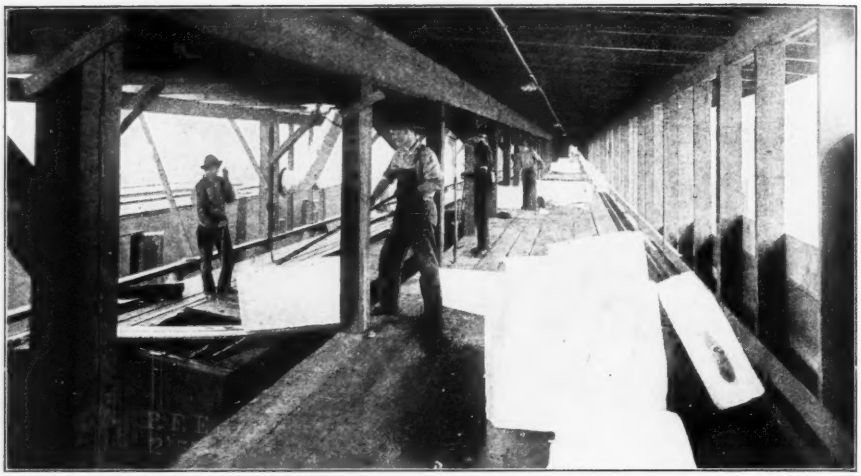
By RUFUS STEELE

THE world at a distance is to know at last the matchless flavor of California fruits when matured upon the trees. No more will Fifth avenue be satisfied with grapes that were green when they left California — no more will Chicago be content with peaches that softened on the way. The old method has seen its end, for engineering skill and the investment of an enormous sum of money have abrogated its necessity.

The new pre-cooling plant at Roseville, California, which had its first practical demonstration early in October last, makes it possible for the first time to ship ripe fruit to the Atlantic seaboard. Also, it insures the California grower a better price than ever he has received.

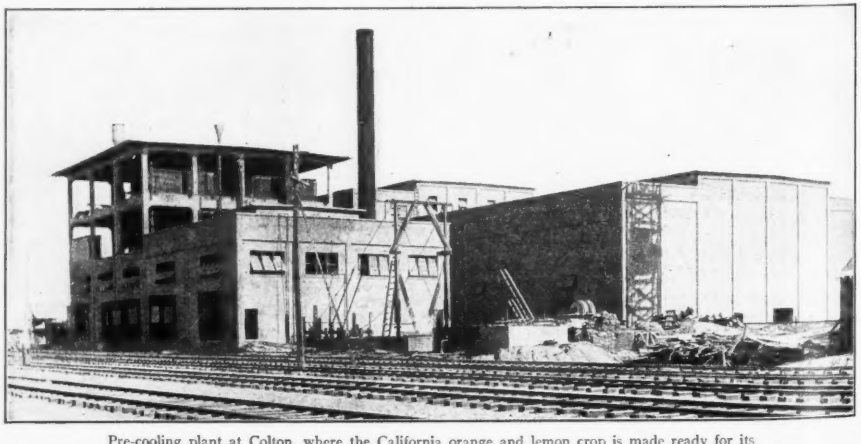
Twenty years ago only the very hardiest California fruits might be shipped as far as Salt Lake—the shipping industry was almost nil. Then came the refrigerator car and with it an era of new possibilities. The introduction of this ice-packed, air-tight car, providing safe transportation for highly perishable fruits, has been responsible for the development of an output which, in the year 1909, reached about sixty-six thousand carloads, valued at over $70,000,000.

The perfecting of pre-cooling, it is believed, will mean almost as much to the California fruit industry as did the coming of the refrigerator car. It will create for California fruit a demand impossible of estimation at this time. The average time required for a car of fruit to make the trip to New York is nine days—to Chicago, seven days. A car of grapes, for instance, though heavily iced, would start Eastward with a temperature of seventy degrees. Though the ice-bunkers were regularly replenished at frequent intervals, such was the heat in the fruit at the time the grapes went into the car, that perhaps five days



Stocking the refrigerator cars with real ice

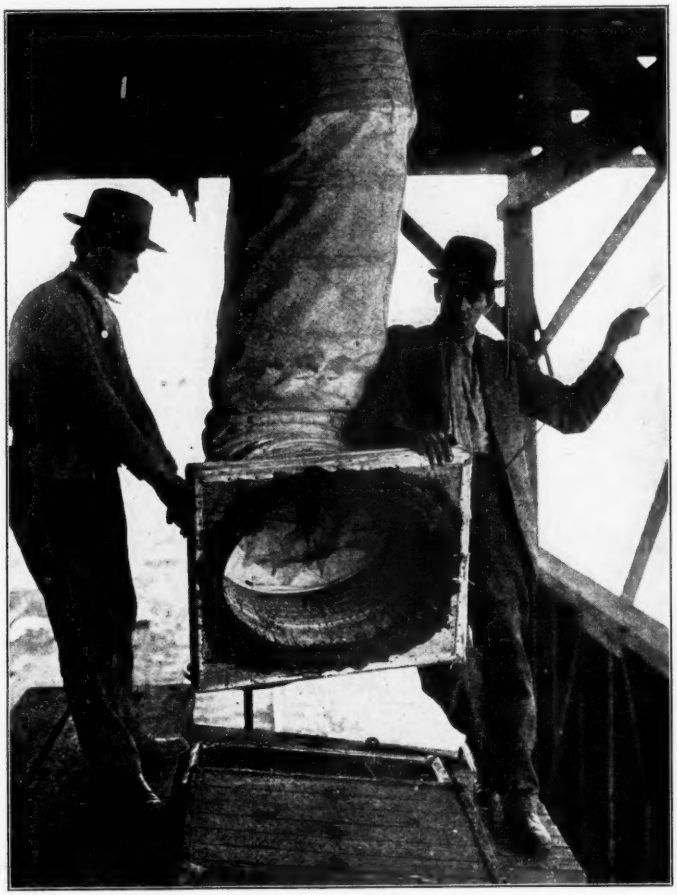
would elapse before the temperature fell to forty degrees, and ripening, or the development of decay, was stopped. Naturally, the grapes had to be picked green enough to stand five days of ripening in the car. Unfortunately the full richness of flavor is found only in the grapes that mature upon the vine, and thus New York, while eating ripe California grapes, never has known how good a California grape ought rightfully to be. The same condition has held true with practically all the other important fruits and vegetables raised in the orchards and gardens that border the Pacific. For several years experiments have been in progress which sought to reduce the temperature of fruit fresh and hot from limb or vine as it went into the car. Most of the systems tried were found expensive and impracticable. From chilling baskets or crates separately, the refrigeration experts turned their attention to the handling of cars after they had been packed. Even when it was found possible to chill a carload at a time no practicable results had been obtained, for a fruit train could not wait upon a siding while each of its many cars was separately treated. And then the Pacific Fruit Express Company and the Southern Pacific Company conceived the



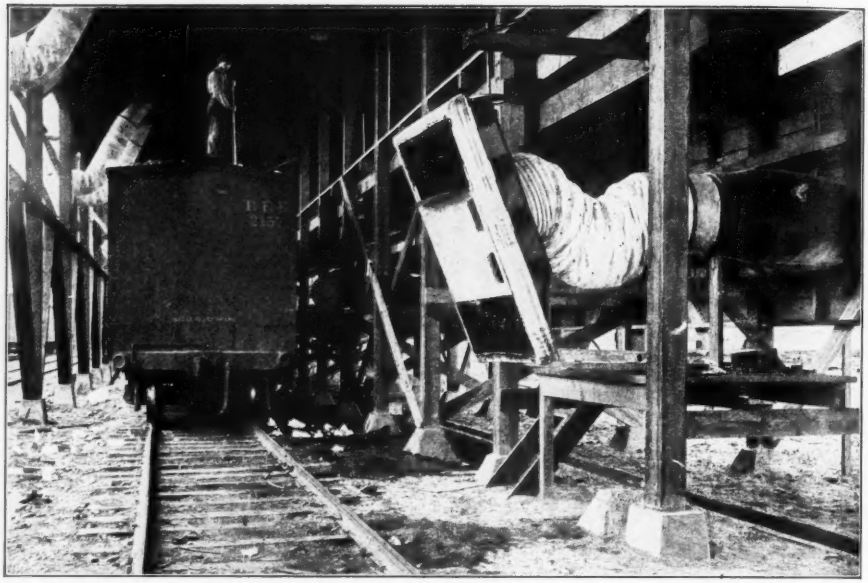
Pre-cooling plant at Colton, where the California orange and lemon crop is made ready for its journey to Eastern markets

great pre-cooling plant at Roseville, twenty miles north of Sacramento, at the junction of the Ogden and Shasta routes, making use of the "Intermittent Vacuum System," controlled by L. A. Roy, of Chicago. Under the direction of Arthur Faget, consulting engineer, more than a million dollars was spent in erecting a plant which could have no practical demonstration until it was completed. The plant was built in conjunction with the ice plant of the company, the largest in California. The first test was made on October 9th, last. This initial demonstration was with a train of refrigerator cars loaded with ripe grapes brought from Lodi and run into the cooling sheds. Ten cars were cooled simultaneously. In two hours the temperature within the cars fell from seventy to thirty-eight degrees. The cars were then dispatched to New York and Philadelphia with a delay of less than three hours. There was no ripening, no decay after the cars left Roseville, and ten days later those grapes were exposed in the markets of the two Atlantic cities in precisely the same condition as when they left California. The capacity of the Roseville plant is twenty cars at a time, and the plant will begin operation at full capacity with the first fruit crops of this coming season. The erection of an exactly similar plant is well under way at Colton, in the southern part of California, for the handling of citrus fruits and vegetables.

An idea of the products to be affected by the new pre-cooling process, products which may now be allowed to attain luscious maturity upon the stem may be gained from an analysis of fruit shipments during the season of 1909. California shipped to Eastern markets forty-five thousand carloads of citrus fruits, including oranges, lemons and grapefruit; thirteen thousand five hundred carloads of deciduous fruits, including cherries, apricots, peaches, pears, plums, apples, grapes, persimmons, etc.; six thousand five hundred carloads of



The outlet or exhaust-pipe from the car, of the new vacuum process



The car shed, showing the method of connection and of forcing the cold air into the car

vegetables, including celery, cabbage, cauliflower, onions, lettuce, tomatoes and potatoes. All these products were necessarily picked before ripening was complete. They brought $70,000,000 in Eastern markets—how much more might they have brought had it been possible—as it will be possible—to let them mature on the stem? Undoubtedly the California grower may prepare himself for better returns than ever before, and loss through overripening in the car will be abated entirely.

The pre-cooling plant at Roseville is a most interesting place to visit. It is combined with the ice plant, which has two three-hundred-ton refrigerating machines (capacity in ice-making one hundred and fifty tons each) and is much the largest ice plant in California. The cooling process is simple. Two great fans drive currents of air through a huge coil-box of ammonia pipes and along delivery ducts through regulating valves, flexible canvas connections and a false door into the car, where deflectors distribute it evenly. The air passes out through two canvas connections above the ice-bunkers at the ends of the car and back to the fans again.

The two fans are each ten feet in diameter and each is capable of delivering fifty thousand cubic feet of air a minute. The coil-box is eighty feet long, thirty-two feet wide, and contains eighty thousand feet of two-inch pipe with more than twelve thousand ammonia joints. The box is made of hollow tile re-enforced with steel, and has an inch of asphalt all around it as an air seal. The coil is in two sections and the air passes from the upper to the lower. The delivery duct is made of No. 16 galvanized iron, is sixty inches in diameter and four hundred feet long.

The first step in cooling is to exhaust all the air in the car by use of a Roy Sprague intermittent valve. The exhausting process is repeated every fifteen minutes during the first hour to rid the car of all gases given off by the fruit itself.

The cooling shed is nine hundred and fifty feet in length. The twenty loaded cars to be treated simultaneously are run into the shed, ten at each end. The doors are unlocked and swung open, the false doors clapped into place, the canvas connections quickly made, and the process begins. So perfect is the system that the temperature within the cars could be reduced to zero if desired. For practically all the products handled, it is believed that the ideal temperature will be found to vary from thirty-eight to forty degrees Fahrenheit. While

the connections are being removed and the cars sealed after the desired temperature has been obtained, a procession of huge ice-blocks comes along the platform level with the car roofs on a chain-carrier, and the cars are iced with no additional delay. Three hours after a car arrives at Roseville from the vineyard or orchard where it was filled, it may be proceeding on its way up the Sierra. A crew of fifty men operates the cooling plant. As this Roseville ice and cooling plant stands to-day it represents an investment of over $1,000,000.

The fame and value of pre-cooling will go to Eastern markets with the first crop which is handled through the sheds of the Roseville or Colton plants. A finer product will mean a wider demand, and a wider demand will mean a better price. It would seem that the California grower may expect a substantial benefit without stretching out his hand.

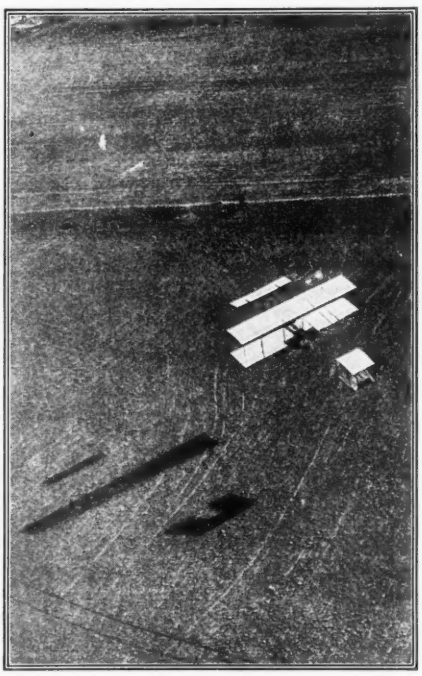
From One Air-craft to Another

By Arthur C. Pillsbury

WITH ILLUSTRATIONS BY THE AUTHOR

MANY of us have not seen the new heavier-than-air machines at all; a few of us have seen them in flight, but those who have witnessed their wonderful birdlike soarings have seen them only from the ground.

It was my good fortune to have a solitary seat in a captive-balloon some three hundred feet above the heads of the people in the grandstand at the Los Angeles aviation field, and to have the "bird-men" circling below, on a level, and at times, in the sky above me. I could follow every movement of that king-swallow, Paulhan, in his sensation-hunting flights; of Curtiss, the humming-bird, in his swift biplane driven like the wind with his engine of eight lungs; of Willard, he of the delicate touch, who picks up two hundred and fifty-dollar purses by flying from a mark and stopping at the same line three minutes later after circling the track; of Harmon, the gentleman-bird who goes to lunch in his mammoth balloon and flies to his dinner on wings of silk; of Miscarol, practicing with his Bleriot monoplane—a dragon-fly that skims around the course with wheels just touching the high spots, then up in the air a few feet, stopping, jumping out, swinging its tail around and off again in a new direction.



Looking down on a flying biplane and its shadow on the field

All of these events went on below me, and I, from a seat on a few sand-bags in the basket of the balloon, with my legs through the net that held the shallow basket, kept my busy camera outside the net. It was a daily position to be envied really by occupants of the grandstand and boxes who had paid many dollars for their lower vantage points. At a height of three hundred feet above the forty thousand spectators, sounds came in waves and masses, and the

shrill barking of souvenir program, hot peanuts and bottled-beer venders was like the sharp rattle of small guns in a cannonade. Then, when Paulhan, starting behind the tents in a hollow, and flying almost out of sight, suddenly appeared, and when directly over and about fifty feet above the grandstand, stopped his engines and glided over the heads of the startled people to the field below, I could have heard a pin drop, the noise ceased so suddenly. Then, in a volume, that almost made the balloon tremble, came the cheers, for the American people like to be startled.

The air line of the Sunset Dirigible Express

Society in the air will soon be the thing, and I think I can claim to have received the first afternoon call. When Roy Knabenshue came circling in his dirigible he did not knock or send up his card, but inquired about the weather and how the wind blew, and other bird-society small talk.

Then Paulhan flew by, waved his hand, and started to explore some of the farms I could see off toward the ocean. What a scattering of birds and barnyard fowls there was. They must have been panic-stricken at this strange, new fowl with its queer, sparsely-covered skeleton and strange, motionless wings. After sailing over a lake just for the fun of it, came gliding back, rising and falling in great sweeping curves, passed over the grandstand again and flew off to inspect the ruins of an old adobe dwelling over to the east of the field, a mile or so. One could almost imagine him to be a great swallow looking for a suitable place to build his nest, or perhaps hunting for his next meal. But instead of that he is getting some twenty thousand dollars per month to do what is to him his greatest pleasure.

To me, looking down from aloft, the field is like a vaudeville performance; each "bird-man" comes out and does his little stunt, and if for some unaccountable reason the other engines refuse to go, Paulhan comes out, most willingly and fills the interval.

When the great bag, New York, was seen miles away, starting from Huntington Park, I could see that the wind was blowing toward the Dominguez field, and after a while the balloon seemed to grow larger, then people's voices came up to me, exclaiming: "Here comes the balloon!" This was true; mile after mile it slowly drifted in until the great trail rope became visible and the people in the basket could be seen waving a welcome, then the rope dragged over the telephone wires outside the field, then over the fence guarded by deputy sheriffs every few yards, who failed to stop them and collect the fifty cents admittance-fee, then the Signal Service boys ran out to meet it, and, grabbing the rope, led the giant bag, beautiful in its symmetry with the sun shining on its oiled surface, up to the very center in front of the cheering crowd, and looking down on it from my elevated seat, I could see the valve open and shut, then open again, till the huge basket, crowded with ladies and gentlemen came gently to earth in the exact center of the white starting point. To me in my small balloon, this was like the arrival unexpectedly of a great parent of the same species, and in the slow majesty of its approach nothing could have been more thrilling. But in five minutes it was pulled into the field, and a little later the valve opened to stay, and the great bag soon lay flat on the ground and its eighty thousand feet of gas scattered to the winds.

Flying Men-o'-War

(*Continued from page 257*)

Soaring over water is not particularly hazardous as most of the successful aeroplanes are sufficiently buoyant to support themselves and their aviator in the water for even extended periods of time. Latham fell into the English Channel and was rescued together with his Antoinette monoplane, while Willard has managed to survive with his Curtiss biplane at least six immersions.

The question of deciding to whom credit should be given for the present advanced stage of heavier-than-air machines is one that requires a nicety of discrimination and careful weighing of facts that is beyond the power of any one man's opinion. There are a few epochal achievements, however, that may be cited without expressing an opinion. Some of these are given below.

Professor Samuel P. Langley, of the Smithsonian Institute at Washington, conducted a number of successful experiments in aeroplane types which surpassed all previous efforts, and which would have been undoubtedly successful had gas-engines then been known. As it is, to-day his principles have been proven sound, and all aeroplanes embrace their main points.

Clement Ader constructed a bat-like machine weighing eleven hundred pounds and having a wing-spread of fifty-four feet that was power-propelled. It carried a man and flew for a distance of one hundred and sixty-four feet on October 9, 1890. This was the first successful man-carrying flight in a power-propelled flying-machine.

John J. Montgomery, professor at Santa Clara College, Santa Clara, California, on April 29, 1905, startled the world by a demonstration of equilibrium and control that has been characterized as the greatest single advance ever made in the history of aerial navigation. Briefly stated, this exhibition, which was made in the presence of thousands of spectators, was as follows: Daniel Maloney, a fearless parachute-jumper, ascended to a height of four thousand feet in a heated-air balloon, taking with him a forty-five pound gliding double-monoplane designed by Professor Montgomery. At the height mentioned, Maloney cut loose from the balloon and commenced gliding to the ground, his machine being under absolute control. In describing this descent, Victor Lougheed, author of a most exhaustive and instructive work on aerial navigation, states:

> In the course of the descent the most extraordinary and complex maneuvers were accomplished—spiral and circling turns being executed with an ease and grace almost beyond description, level travel accomplished with the wind and against it, figure eight evolutions performed without difficulty, and hair-raising dives were terminated by abrupt checking of the movements by changing the angles of the wing-surfaces. At times the speed, as estimated by eye-witnesses, was over sixty-eight miles an hour, and yet, after a flight of approximately eight miles in twenty minutes, the machine was brought to rest upon a previously designated spot, three-quarters of a mile from where the balloon had been released, so lightly that the aviator was not even jarred, despite the fact that he was compelled to land upon his feet, not on a special alighting-gear.

Louis Bleriot crossed the English Channel in a Bleriot II on July 25, 1909. This machine is a monoplane, the result of careful study and much expense to Monsieur Bleriot, who has been engaged in aerial investigations since 1901.

The Wright brothers, at Dayton, Ohio, from September 26th to October 5, 1905, made six flights in their biplane at distances varying from 11.12 to 24.2 miles, at a speed approximating forty miles an hour. These men are particularly prominent, because of their persistence, energy and concentration in their labor covering a period from 1900 to the present time.

Gabriel Voisin, a French engineer, has developed, since 1904, a biplane that is controlled by devices different from those of the Wrights. Their machine while not of itself a perfect one, is chiefly of merit through being the forerunner of the highly successful Henry Farman machine.

Glenn H. Curtiss has developed a biplane along general lines similar to the Wright and Farman machines, but differing from them in the specially-constructed four and eight-cylinder Curtiss engines, and in the method of control and steering-gear.

While the monoplanes and biplanes differ in many essential features there are yet several important particulars in which all aeroplanes are in practical accord. For example, all have curved wing-surfaces, approximating the parabolic; all have means for varying the resistance of the right or

The Executive Committee in charge of the Aviation Meet at Los Angeles. Standing, from left to right, are: Dick Ferris, general manager and promoter of the meet; Martin C. Neuner, F. J. Zeehandelaar, secretary; Perry W. Weidner, treasurer; D. A. Hamburger, chairman; and William M. Garland. The individual portrait is of Fred L. Baker, the remaining member of the committee

left wing-surfaces each independent of the other; all have rear rudders for lateral steering, and all biplanes have front elevators for rising in the air or dropping toward the earth.

All propellers are either tracting or driving, that is, either "pullers" or "pushers," as they are placed in front of or behind the wings. The Wright machine and several other biplanes have twin propellers. The Farman, Curtiss and Ferber biplanes use but one propeller. The best practice includes propellers of but two blades, although three-bladed and four-bladed propellers are used to some diminishing extent. They are made of wood almost without exception, and have a maximum length of about eighty-four inches. Their pitch and shape are so variable as to defy description, a remarkable feature being that a most successful propeller for one type of flying-machine may prove an absolute failure when applied to another of but slightly different design.

Engines used are of all types and their limiting weights are from one and a half to seven pounds to the horsepower. They are "direct-driven" and produce from eight hundred to twelve hundred revolutions of the propeller a minute.

The foregoing brief, general description of the principal features of these air-craft, while by no means complete, will have accomplished its object if it serves to convince the reader that man has at last accomplished definite results in mastering the air—that goal toward which Montgolfier set the first milestone when he made, in 1782, the first known successful hot-air balloon.

It is not beyond the dreams of sane men to prophesy that air-craft will soon be as common and as much accepted as actualities as are automobiles; it is highly probable that the military and naval use of such vehicles may produce important changes in the laws of war; it is almost certain that import duties on light articles will be eliminated, for who can guard the air?

Greatest and most far-reaching of all is the scope of aeroplanes as levelers of social barriers and as influences on the general development of mankind toward a common plane of knowledge through travel with its attendant broadening influences.

Development Section

Here are Noted Various Significant Facts Relating to the Progress and General Advancement of all the West

"Over Against the Coast"

Modest Contra Costa, Rich in Virtues—The Romance of Her First Ranch—Beautiful with Hills and Vales—A Mountain with a Queer Name and Farms and Orchards Grouped About Its Base

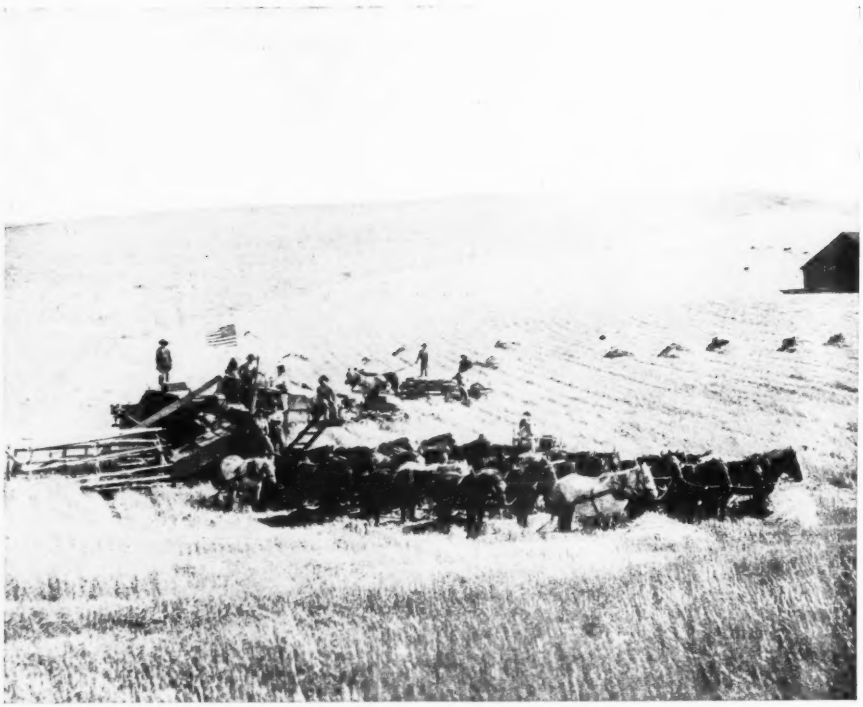
By A. J. WELLS

The San Joaquin borders the fertile lands of Contra Costa

HERE is in outline the romance of Contra Costa's early history. It is in four chapters, but lawyers could easily add a fifth which would not interest the public. Dr. John Marsh is an educated physician in Wisconsin. He has a wife and son and ample means. His wife dies—and the doctor forsakes his home, abandons his boy and is lost to his friends and relatives.

In 1840, he finds himself in the hills of the Contra Costa country—follows a winding stream and comes to a happy valley carpeted with grass and flowers and shaded by great spreading oaks. Here he makes a home, acquires a vast tract of rich land, gathers, in time, immense herds of cattle, and after the manner of the country, lives in rude independence, "a man without a country." Gold is discovered in California, and the changed order of things makes him rich.

Meantime, his boy had grown to manhood—and this Japheth sets out to find his father. He hears from returned miners that a Doctor Marsh lives in California, and he makes his way to that far-off



In eastern Contra Costa an abundant rainfall insures a heavy crop on a vast area, and the annual harvest is a mighty combination of men, horses and machinery

land and, one day in March, 1856, walks in and surprises his runaway pater. We do not hear anything about a strawberry mark, but there is a rumor of a scarred big toe by which the hermit doctor is identified, and the son settles down in the secluded valley and the prodigal father has the hired man kill one of the range calves and they call in the herders and have a barbecue.

The summer passes and in the autumn Doctor Marsh starts for San Francisco. Believed to carry on his person a large sum of money, he is waylaid and murdered. The son steps into his father's place, but the great ranch becomes a source of contention, and after thirty years of litigation the courts, culminating last year, 1909, have ordered a partition, and it will be divided and sold off. Marsh creek winds murmuring among the hills, great crops of wheat and barley grow on the level lands, a huge three-storied stone house stands empty under the trees, and the whispering sounds mayhap could tell a story which would put life into this skeleton which we have drawn.

A LAND OF VALLEYS

You can start with Mount Diablo in your eye from almost any point of the compass and bring up in a charming little valley. Some of them, head close to the base of the peak, others lie in the long shadow which the mountain casts twice a day, and all are ensconced between low, rounded hills, and are ideal farm sites. If you cannot have valleys without hills—why these velvety-looking uplands of Contra Costa are not bad to have on the farm. They make the landscape interesting—they are good grain or hay lands, and a Frenchman gets them into vineyards quickly after getting his deed to them.

The valleys bear some Spanish names as Pacheco, Ignacio, San Ramon, Rodeo, San Pablo and Pinole, but there are no long-horned Spanish cattle here, nor Spanish hidalgos in the midst of great ranches.

It is a peaceful countryside—a land of farms and farmers, with quiet towns not yet too ambitious to become cities to have put off their sunbonnet and dusty shoes of simple, rural beauty. The farmer is the most independent and individualistic of workers, and a farmer's town should bear his stamp and not put on pretentious airs.

The county has a slice of the great San Joaquin Valley within its borders, and if you will get off the Southern Pacific train at Byron, you will easily find your way up into the winding valley where Doctor Marsh—perhaps sore-hearted and unhappy—began his life anew in the West.

The whale-oil plant and long wharf of the Standard Oil Company at Richmond—where the whalers from the Arctic seas unload their booty

Here are general purpose farms, dairy farms, stock farms, hay farms, fruit farms, vineyards, factories of many kinds, vast industries employing in the aggregate thousands of men and setting free in communities hundreds of thousands of dollars yearly. Here is seventy miles of water front—deep water—where ships can load and discharge cargoes. Here are great cities on the edge of the county. Oakland is now a city of 200,000 people, and with Alameda and Berkeley, 50,000 more. San Francisco is just across the bay, within cannon-shot of the county's boundary, and factories are pushing out from the larger centers for the sake of deep water, room to expand, and cheaper sites where ship and shop and rail can come together.

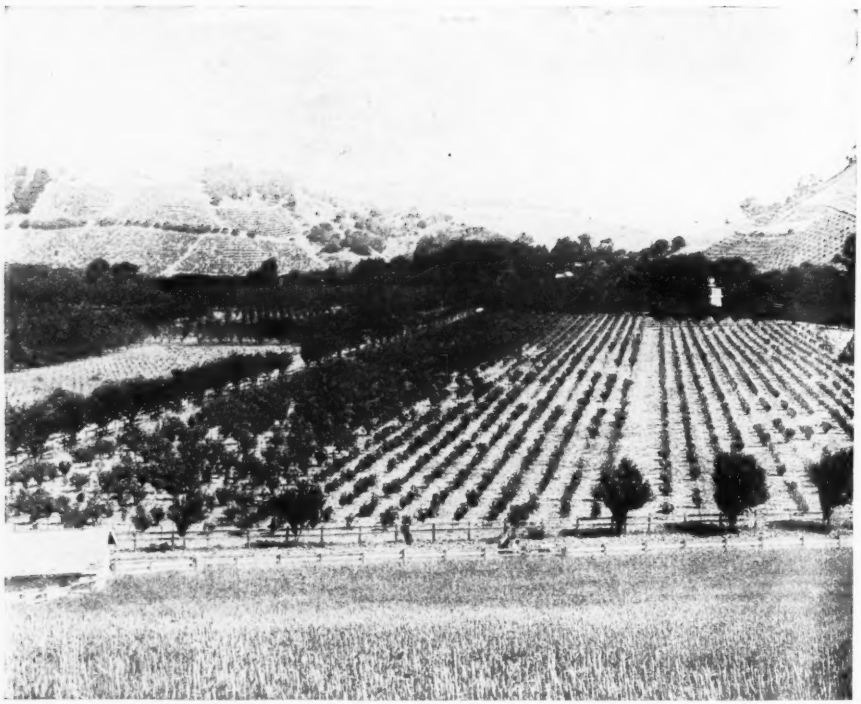
All this lays the foundation for the various forms of industrial development in the county, an intense economic life and a denser population than agriculture alone can possibly foster.

And it makes a basis for the success of the small farmer in two ways—it provides a home market for his products, and it makes the payments on his farm easier and more secure. In many cases he has only his labor to start with. He must buy land of one man and borrow money to build with from another. Then he must pay for both out of the wise use of the land he has bought and of the labor which is his only original capital. He may need to earn wages as well as to grow crops. His boy may work in a factory and help to pay for the home. An older girl may find work in a cannery and help win independence for the family. If the family are wage-earners—the factory towns offer steady employment to steady workers—and thrift will look out for a town lot or for an acre of ground and put surplus earnings into a home. If on the outskirts, and in the line of improvements, it will have a twofold advantage—the acre will furnish half the living and it will grow in value while you wake and sleep. A home saves rent—a town lot may be a lever to lift its owner out of a hole.

This we repeat is the unity of this community—unity in diversity. Contra Costa is laying broad and deep the foundation of prosperity.

A GREAT FUTURE

The industrial battle line is seventy miles long, and is being steadily consolidated. Manufacturing plants will ultimately occupy every desirable acre. Some of the largest establishments on the Pacific Coast are here. Richmond—to mention but one point—has grown from a cow-pasture to a city of 12,000 inside of twelve years, and the monthly pay-roll of her industries amounts to nearly $250,000.



In the Alhambra Valley, Contra Costa—a beautiful corner filled with flourishing orchards and vineyards

It is estimated that the combined capital of the various corporations doing business on Contra Costa shores from Richmond to Antioch is nearly $600,000,000.

The roots of these industries are in the oil fields of California, in the forests of Oregon, in the whale fisheries of Northern seas, in the sugar-cane fields of Hawaii, in the rubber forests of Mexico and South America, in the vineyards of California, and the streams of the Sierra Nevada.

With the completion of the Panama Canal, the development of the resources of the Pacific Coast, the commercial mastery of the Pacific Ocean and the inevitable progress of the Asiatic countries, the bay of San Francisco will be the theater of a vast activity, and this bay county will have its share of the growth that is fairly in sight.

Then here is proximity to the city. Neighborhood counts. Contra Costa county is just "next door," and the trolley and the automobile and the steam lines and the yacht on the bay all make the city with its attractions convenient.

BYRON HOT SPRINGS

This is part of the charm of the great hot springs at Byron. They are but three hours' ride by automobile from the bay. Some day, the fact that Byron hot springs are as great and efficacious as any spa in Europe will be conceded. Californians are disposed to bet on it, because it is backed by a climate which is an atmospheric spa—a kind of aerial spring in which we live and in which we believe more devoutly than in the Fountain of Youth.

The hotel follows in the main the early Spanish style brought here by the Franciscans, and it stands in the midst of much tropic beauty—the verandas in midwinter telling in the language of flowers "the story of the eternal springtime."

Contra Costa was sketched in the SUNSET quite fully a year ago—it has been written in detail in the handsome booklet published by the board of supervisors, and in this issue of the magazine we have chosen to present the larger aspects of the situation. The sagacity which led Doctor Marsh to locate in this county when the wide world of California was before him almost untenanted, shows how strongly the beauty and the climate appealed to him.

If you think he may have overlooked the quality of the land, go up along Marsh creek as far as the big stone mansion and judge for yourself. A land of hills and valleys, it is also a land rich in those qualities of the soil which the farmer must bank on, and out of which is born the wealth of his harvests.

Empire-building Irrigation

How An Inland Empire Has Been Created in Fresno County, Central California

By WILLIAM ROBERTSON

FORTY years ago an arid waste where millions of acres were lying scorching under the burning rays of the sun; to-day, sixty thousand good American citizens, reveling in the luxuries of life, enjoying all the comforts of civilization and developing a county of vast resources and imperial greatness. This was, and is the condition of the county of Fresno, situated in the center of the great San Joaquin Valley, and also in the exact center of California.

To an area which, forty years ago, lay under the ban of desolation, a place inhabited by the owl, the rattlesnake, the coyote and the squirrel, to-day people doff their hats as to the queen of the Pacific slope. Fresno county is to-day the great leader in agricultural and horticultural wealth, in the splendid demonstration of what can be achieved through the marriage of soil and water, blessed with the ardent rays of the sun. Under irrigation Fresno has become the imperial county of this great state—not a land of promise, but a land of actual and magnificent results, where nature's bounty has showered its blessings and filled with wealth the coffers of its people. Instead of the arid plain and the hoot of the owl, beautiful orchards have arisen, filled with the feathered songsters of the grove, and all nature rejoices in its productive plenitude.

The boundaries of Fresno county are defined by the noble Sierra Nevada range on the east and the Coast Range on the west, and they embrace a variety of climatic and soil conditions not to be found elsewhere in the valley. The county may be divided into four distinct regions—namely, snow, timber, foothill and valley, creating a variety of temperature which enables the people to produce everything in the range from Arctic to semi-tropic crops.

The county contains 5,606 square miles, or 3,587,840 acres. The rainy season extends from the end of October until May, and the average rainfall is eight inches per annum. The summer months extending from June till September are rainless and the air is dry, and while the temperature occasionally rises to 112 degrees there are no sunstrokes, no thunderstorms, and no mad dogs. The nights are cool and comfortable, giving rest and recuperation and making possible many enjoyable social entertainments, in marked contrast to the sweltering nights of the East. While speaking of the heat we may here remark that it is our best asset, filling the fruit with saccharine and curing it with the sun's rays, thereby making it the purest and best of all fruits—no adulteration, no addition of extraneous matter, nothing but the simple influence of Old Sol in creating a new condition in the fruit sugars and acids, and making them more palatable, nourishing and digestible.

Irrigation has transformed a desert waste into a county producing annually over $30,000,000 worth of products, or a per capita of $500 for every man, woman and child in the county.

Fresno county has demonstrated to a certainty that in a land where irrigation is practiced uninterrupted prosperity reigns; that the storage of the perpetual drain of the everlasting snows is more reliable as a provision of nature than the uncertain rains of any country, because of the proper distribution of water in necessary quantity at the right time.

It has also resulted in the establishment of telegraphs, telephones, daily rural mail delivery, railroads, electric cars, schools, libraries and churches. The daily morning news is discussed throughout the county with the breakfast roll.

To show the wealth-producing power of irrigation a retrospect of conditions in 1870, compared with those of 1909 is instructive. In 1870 cattle ranches and wheat farms formed the staple industries of Fresno county, the latter with such variable results as to constitute almost a gamble. To-day prosperous fruit farms, alfalfa and dairy farms and splendid vineyards surround beautiful homes and create the incomes necessary to maintain them. We read a great deal about the magnificent homes of southern California, but these are almost entirely supported by the incomes of Eastern millionaires who made their money in Eastern commercial enterprises and are spending it in living luxuriously in the glorious West. But Fresno county has created its millionaires and is maintaining them with the prodigality of its productive wealth and the handsome incomes accruing therefrom. Take as an example the case of the late M. Theo. Kearney, who came to California in 1866 a penniless adventurer, and who managed to acquire 7,500 acres of land which was, in 1875, considered of little value, yet in 1904, when he died and left it as an heritage to the University of California for the purpose of an agricultural experiment farm, the gift was valued at $1,500,000. He spent $55,000 in making one of the most beautiful boulevards in the world, over $60,000 in laying out and planting a home park, which is without a peer in the variety and rarity of its trees and plants. He literally squandered thousands of dollars in experiments, and yet, after all, left a splendid property, every dollar of which was earned by the land itself, showing the marvelous

Prize winning stock grown on irrigated land

wealth which lies in the soil of Fresno county. In a lesser degree, cases can be quoted of thousands of others who came to Fresno county very poor, and who to-day, stand on the top rung of the ladder of prosperity, rejoicing in the wealth which nature yields them. Here then, we have a land not merely of promises made, but promises redeemed, hopes fulfilled, the experiment stage passed into the full fruition of a certainty. This certainty has an unfailing guarantee—so long as the grand old Sierra Nevada mountains lift their summits into the region of perpetual snow, paying the yearly tribute of the melted element into the valley through the course of its noble rivers, just so long will nature revel in abundance and the husbandman rejoice in his prosperity.

The present prices of land in Fresno county are so moderate as to make investments attractive, the handsome returns realized showing an unusually large percentage on the invested capital. With the opening of the Panama Canal in 1915, California lands, especially the most productive of them, such as those of Fresno county, should appreciate tremendously in value. There is then every inducement for the capitalist or homeseeker to buy rich Fresno county lands on the certainty of a rapid accretion of wealth.

To anyone desirous of making a home there are endless possibilities in the many diversified forms of viticulture, horticulture and agriculture in Fresno county.

Take as an example the dairying industry which possesses boundless possibilities for the farmer. Every convenience is arranged by placing creamery stations at convenient points and sending wagons round to collect the new milk. After being separated, the skimmed milk is then returned to the farmer who uses it for feeding calves and hogs. The creameries make settlements every month, and on the fifteenth of each month a check is mailed for the amount due on butter-fat. This makes a ready return of cash and enables the farmer to pay his way as he goes along.

Raising of stock of all kinds is also a lucrative business, especially mules, which command high prices and are in big demand for the Orient, since it has been found that they are even better adapted to the climate than are horses. Fresno county seems to be an ideal place for breeding them judging from results.

The reputation of Fresno county as the greatest raisin-producing district in the world is firmly established. Its warm climate fills the grape with saccharine, and its peculiarly dry atmosphere and its dewless nights make it possible to cure the fruit naturally by the rays of the sun, so that no one eating the pure, sun-cured California raisin, need ever fear the necessity of calling for the operation

Gathering the grapes to make raisins for a nation

of the pure food act. When the nutritious qualities of the raisin become better known it will assuredly come into the homes of the wage-earner as a necessity and will not be classed as a luxury as it now is. As a strong evidence of its usefulness this statement of its food value may interest the reader:

COMPARATIVE FOOD VALUES

One pound of California raisins represents a food value equal to each of the following:

Six pounds of apples.
Five pounds of bananas.
Four and one-fourth pounds of potatoes.
One pound of bread.
Four pounds of milk.
Four and three-fourths pounds of fish (edible portion).
Two pounds of eggs.
One and one-third pounds of beef.

An important medicinal value of raisins is in their laxative effect.—*U. S. Department of Agriculture Bulletin, No. 142.*

There is no branch of horticulture so thoroughly enjoyable as the raising of oranges, lemons and the other fruits of the citrus variety. The beautiful golden fruit with its setting of rich dark-green foliage appeals to man's sense of beauty, and the large returns derived from the fruit make it most attractive as a commercial commodity. The labor of raising and marketing oranges is relatively small when compared with that of other fruits, and the returns are greater. The orange is also a long-lived tree and increases its yield as it gets older. Trees ten years old frequently yield a return of $800 to $1,000 per acre. Fresno county oranges are noted for their fineness of flavor, and as they come into the market a month to six weeks earlier than those of southern California, they catch the early market and the best prices.

Fig-culture has become one of Fresno county's leading industries, and to one of its citizens belongs the honor of having introduced successfully into commercial prominence the genuine Smyrna fig. After years of hard study and intelligent application, Mr. George C. Roeding managed to acclimatize the *blastophaga grossorum*—a little wasp which is necessary to fertilize the Smyrna fig. In this manner was established an industry which is yearly growing in importance and which has brought fame to Mr. Roeding.

When we have told what irrigation has accomplished for Fresno county, we have not exhausted its resources. Outside of its agricultural possibilities lie many interesting and extraordinary features. One of these is the wonderful Coalinga Oil field, a region producing vast wealth, and at the present time supplying one-thirtieth of the world's entire output. Its history reads like a fairy-tale. Ten years ago it was unknown except as a barren waste—to-day a thriving city stands in its midst. Many of its citizens are millionaires through its production, and there is not in all California to-day a livelier business town of its size. To give some idea of its growth we may state that in 1900 its production

From the fastnesses of Kings River Cañon comes the water that has been used to transform the Fresno country

of crude oil was 500,000 barrels. Last year it was 12,000,000 barrels, with manufactories producing over one hundred by-products from it.

Lumber is also a great industry of Fresno county which exports it yearly to the extent of about 75,000,000 board feet. An interesting feature is the groves of the marvelous *Sequoia Gigantea*, the big redwood trees, believed to be the largest and oldest living things on earth. Many of these trees measure thirty-five feet in diameter and are from four to six thousand years old. Strong connecting links between past and present—if they could speak what tales might they not tell of the world's evolutionary changes.

The mineral wealth of Fresno county is also an important item. Copper, gold, silver, granite and brick amounting to nearly $4,000,000. The county is also rich in magnesite of the very purest to be found in the world. There is a growing demand for this mineral, and it is yearly increasing in value because of the almost unlimited number of purposes to which it may be applied.

Dotted all over the county are cities and towns, busy distributing points such as one expects to find in a prosperous county like Fresno. Of these the city of Fresno is the county-seat and the largest and most important city in central California. It has a population of 30,000 inhabitants, six banks with deposits of over $6,000,000, and it has an assessable property valuation of $12,081,154. There are also other important towns, such as Selma, Reedley, Kingsburg, Sanger, Laton, Kerman, and greatest of oil centers, Coalinga—all of them centers of rich producing districts.

The county's total assessable valuation exceeds $63,000,000. It has a splendid school system, providing a liberal education for children in even the remotest districts. Its high schools are affiliated with the University of California. It has churches of almost every denomination, and its inhabitants are for the most part intelligent, law abiding and thrifty.

The shipping facilities of Fresno are perfect. Its transcontinental lines give rapid shipments to the East, while from a shipping point of view the Orient lies at its door.

Taking a twelve months average there is probably no finer climate in California than Fresno county. The hottest month of the year is July when the temperature occasionally climbs to 112 degrees Fahrenheit, the months of August and September are a little cooler, and the remaining nine months are ideal. No matter how hot the days may be the nights are always cool. It is truly a land of sunshine and a land of beauty, and may be summed up in the words of an eminent educator: "It is truly a wonderful county, productive beyond imagination and rich beyond the dreams of wealth."

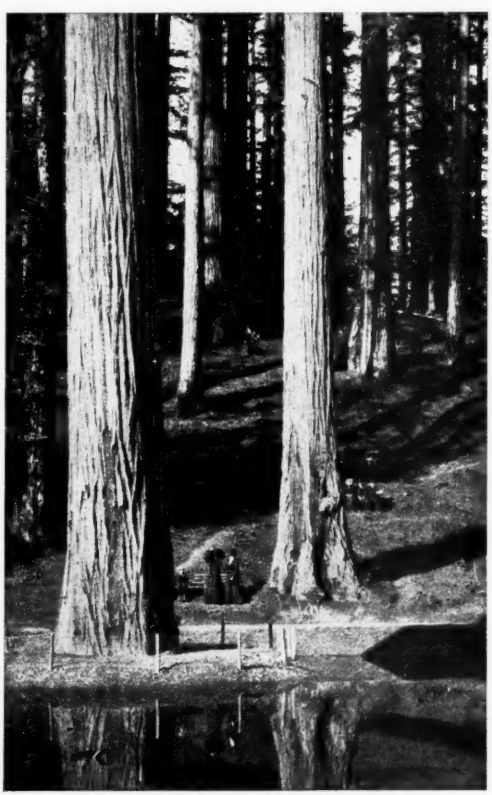
Uncle Sam's Most Western City

Remarkable Resources of Humboldt County, California, and Prosperity of Its City, Eureka

By J. F. Coonan

THE star of American empire that first emerges from the bosom of the Atlantic, at Eastport, Maine, and takes its way, as presaged by the poet, westwardly across the great continental plateau, finally plunges into the waters of the Pacific, at Eureka, California. Eureka, unknown to fame hitherto, will yet be heralded forth as the second commercial emporium of California. England's western extremity is "Land's End"—the "Land's End" of the United States is Eureka. It is the ultimate western city of our country. It is two degrees nearer the Orient than any other city of the United States. In that fact lie hidden great potentialities. Hours saved in the transmission of Asiatic mail and commerce will yet mean much.

If you will unroll the map of our country, and observe the contour of our western coastline, you will note how it bulges out from north and south, forming a bow, with the outer edge of the bow towards the Pacific. There the gracefully rounded hill—Cape Mendocino — dips gently into the ocean. Cabrillo—"the first that ever burst into that lonely sea"—named it after the viceroy of Mexico—Mendoza—who, in 1542, outfitted Cabrillo's exploring expedition. About twenty miles north of the cape you will notice an indentation of the coastline, marking an enclosed basin of inland water. That is Humboldt bay. The bay is about fourteen miles long and varies in width from one-half to four miles. It is protected from the ocean winds by two narrow strips of peninsula, covered with hillocks of sand, scantily clad with vegetation and trees. These peninsulas keep from it storm and tempest. In old ocean's most tempestuous upheaval, this inland basin is as calm and peaceful as the bay of Naples. The channel connecting the bay with the ocean is sufficiently deep to permit the passage over it of vessels of four or five thousand tons. To permit the passage of the largest vessels would require the expenditure of only a few million dollars. Over this channel, in 1908, there safely passed over sixteen hundred steam and sail ves-



Among the redwood skyscrapers in Eureka's city park

Bird's eye view of the city of Eureka.

sels of a total tonnage of over one million, which carried miscellaneous cargoes, valued at eleven million seven hundred and fifty thousand dollars, and passengers to the number of twenty-nine thousand five hundred and thirty-seven.

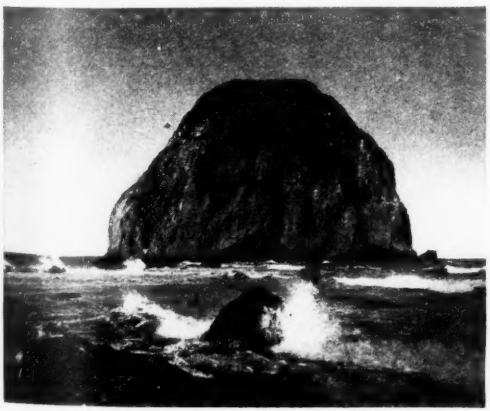
On the eastern shore of this harbor of refuge is the city of Eureka—the largest city in northern California. It is admirably situated on a slope, gently rising inland, and contains now about fourteen thousand souls, has numerous costly private and public edifices, several miles of asphaltum streets, many miles of permanent sewers, a magnificent courthouse, a handsome city hall, a Federal building of spacious dimensions, and a fifty-acre park. Sequoia park is a great attraction for visitors. Nowhere on earth is there a park like it. It is fresh from the hand of nature. Tall, massive trees, shadowy bridle paths, gently gurgling springs, wild flowers and grasses constitute its charms. To pass in a moment from the busy streets of the city into this primeval forest, where stately redwoods tower in silent majesty, produces an exaltation of spirit that can only be compared to that of passing from the busy streets of an old world city into the long drawn aisles and dim religious light of a medieval cathedral.

Eureka has several characteristics that rivet attention. It is the largest city in the United States not possessing railroad communication with other portions of our country. The only way of reaching the city now is by ocean steamers. Its present growth, made while resting under this disadvantage, is an indication that the resources on which the city now relies for existence and maintenance are sound and valuable, and that its growth will be phenomenal when the disadvantage is removed. That period, to which Eureka so ardently looks forward, cannot be far distant. The railroad gap that isolates it from the remainder of California is only one hundred miles in length, and the Northwestern Pacific Railway Company has announced its intention to close this gap at once. Already contracts have been let for the construction of twenty-six miles of the route, and the entire distance will be completed within three years. With railroad communication, Eureka's future is assured. The position of the city is distinctive and important, being situated on the coast almost equidistant between Mexico and British Columbia. It is on the shore line of the only landlocked harbor in California north of San Francisco. It is the natural ocean shipping point of northern California. Siskiyou, Trinity, Shasta, Tehama, Lassen and

Along the silver reaches of the Eel river

the largest city in Northern California

Sierra counties, if once connected by railroad, would be tributary to it. With the Panama Canal looming on the immediate future, and railroad connection with northeastern California now under consideration, Eureka has a future bright with promise. At present, the prosperity of Eureka is dependent upon Humboldt county—a territory comprising about one hundred miles north and south by from thirty to forty miles east and west. Humboldt is not a county—it is a principality. It would easily make a New England state. It is thrice the size of Rhode Island, about one-third larger than Delaware, about half as large as New Jersey. It is considerably larger than Delaware and Rhode Island if combined. These two states have a population of more than six hundred thousand souls. Humboldt has about forty thousand, and has, therefore, plenty of elbow-room. Nor is the area of Humboldt covered with barrenness. Humboldt has an abundant rainfall, the average yearly being about fifty inches. It has also an even, genial temperature. In winter the days are intermittently rainy and sunshiny. Between rains in November, December, January, February and March are days and weeks of cloudless skies, of beaming sun, of gentle heat. No more beautiful weather can be found in sunny Italy. In spring and summer there is scarcely any rainfall. The days are either sunny or foggy. The heat in summer's warmest day never becomes uncomfortable. The cold in winter's most frigid time never descends to a degree where snow falls, except once or twice in every four or five years. With such climatic conditions Humboldt could not be other than fertile. Its area, comprising river-bottom, rolling hill and upland benches, in its natural state is covered with vegetation. Its best known product—the redwood tree—covers some five hundred thousand acres. Its other woods—pine, oak, pepperwood, fir, maple, madrone—cover about four hundred and thirty-seven thousand acres. Its river-bottom and level bench land, suitable for farming, comprises about five hundred and forty thousand acres; its hill-land, used for the grazing of sheep and cattle, about five hundred and eighty thousand acres.

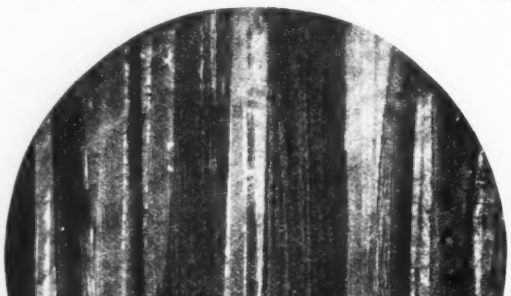


Cape Mendocino Rocks, the ultimate West

The county has more than a score of rivers that would furnish effective water-power for manufacturing. If we view the county from the sea, it appears to be almost an unbroken forest, extending from the mountain summits nearly to the ocean beach. But if we penetrate the forest and follow a watershed that terminates in some sightly mountain crest, we shall

Logging train, loaded with logs cut from a single tree

find from that vantage point a most varied and beautiful scene. The forests of redwood stretch for a hundred miles along the coast in a continuous belt eight to ten miles wide. Adjacent to the redwood belt are embracing areas of lesser timber—pine, oak, spruce, fir, alder and madrone—covering an area almost equal to that of the redwood. Back of the timber belt proper are large tracts of open land covered with native grasses, while in strips, separating the grass lands from the timber lands, is frequently found a tangled and matted wilderness of brush. Far off to the east may be seen snow-clad summits, and winding between the hills are silvery streams that touch with freshness and relieve with beauty the whole grand panorama of nature. There is no barren spot—no hint of scantiness in vegetation. The vast area from mountain summit to deepest gorge is teeming with vegetable life, clothed with forest or grassy carpet—not always green—but of such varied hues from brown and russet to the most brilliant colorings, that the senses are enchanted, and one is uncertain whether to admire most nature's grandeur of conception or her delicate touches in decoration.



In the heart of the Humboldt forest

And what of the harvest from this scarcely touched empire of fertility and beauty? The county to-day ships to market more butter than any other county in the golden state. It furnishes fully one-half of the dried peas sold in the markets of San Francisco. Its flocks and herds provide for the same market an annual tribute of over five million pounds of the choicest beef, pork and mutton. It ships to San Francisco over five million pounds of fish and crabs annually. It ships over eight hundred thousand pounds of wool per annum. Its apples are the choicest produced in the state, and their production is only limited by the facilities for cheap and direct transportation.

The annual cut of lumber is now over three hundred million feet, the output of the eleven large mills now operating. The shipments of the past twenty years have been of a value of from three to seven million dollars yearly.

The most neglected industry of Humboldt to-day is horticulture. With a soil and climate ideally adapted to the production of berries, small fruits, cherries, pears, plums, prunes and apples, none of these fruits, except the last named, have reached the dignity of a selling-place in the export list of the county. The principal reason for this is because of the lack of rail connection with other parts of the state. The want of rail connection, in fact, has retarded greatly the growth of Humboldt and the productions of Humboldt. It has grown to be an important county entirely from itself and its own natural wealth. What will it become when the shining ribbons of steel shall unite it to the markets of the East and West?

Thousands of acres, divided into cozy home farms of forty acres each, will share the water flowing along this broad avenue of prosperity

A New Way to Clear Land for Homes

The Work of the Pittsburg Syndicate in the Sacramento Valley

By MARK BENNETT

MAGNIFICENT plans for the development of a part of the Sacramento valley were described in a general way in the January SUNSET in an article on the work being done by the Pittsburg Syndicate in that section of California. The adjective magnificent is used advisedly, for what term will better express this enterprise? From whatever point one may view it this undertaking challenges his admiration. Coming quietly among the people of California, Eastern men of capital and business genius have begun in a masterful way the solution of one of the most vexing problems the great valley has known. Up to the present time their work has been largely on paper, but several fair fortunes already have been expended in unraveling the snarl of legal complications which so long have defied others. One great task has followed another until finally the work of construction is under way and people are arriving on the land from Eastern states to build their homes and live happily ever afterward.

It is worth while to recall what work has been done during the past year by J. S. and W. S. Kuhn, the two brothers, and J. H. Purdy and other associates, whom California must thank for the great advertisement which the state is getting from this source. First came the inspection of the lands as a whole, and the discussion of the project to determine whether it was a feasible business enterprise which one capitalist could recommend to another, and which might be recommended by them to small investors who rely implicitly upon the business judgment of such men. The fact that others had failed was against it, but the merit of the proposed enterprise finally won. Then the real struggle began.

Unless the project could be made a large one the Kuhn brothers would not consider it. To make it large it would be necessary to purchase the lands outright. The vast tract, stretching from Hamilton City and Willows on the north to the vicinity of Arbuckle on the south and from the Sacramento river on the east to a line several miles beyond the Southern Pacific line on the west, is a princely domain. It embraces the choicest land in two great counties. To buy these lands meant the overcoming of many obstacles. There were obstinate wives and unyielding husbands, dissatisfied children and disagreeing heirs. The patience of angels and diplomacy of a high order were in constant demand from those who were sent to deal with the many landowners whose large holdings were desired, if not necessary, for the success of the enterprise.

To cap the climax of their daring the Kuhns bought all the outstanding bonds which had lain for years as a blight upon the valley and a cloud upon the titles of land under the famous Central canal, whose failure had long been well-known history. With these bonds in their possession the Kuhns offered, in exchange for options at a fair price, to clear the titles by surrendering the bonds in the event of their not buying the land. Trained realty men were employed for months in negotiating for these options which were to run for a year. No one ever had come forward to do so much, and, as the matter is viewed now, it would have been a long time before another such organization could have been found to repeat such an offer. In the office at Colusa were maps and other records showing the owners of every parcel of land to be included in the great project. From Colusa the negotiations were carried on, day in and day out, upon a systematic campaign, defeat one day and success the next, until finally a sufficient acreage had been acquired to satisfy the ambitious purposes of the Kuhns and their great organization.

On the alfalfa fields in the Sacramento valley, from eight to fifteen tons per acre are obtained by six cuttings, in ordinary seasons

Following the acquirement of the options came the examination of titles and the purchase of lands. Complete surveys were now necessary to verify old lines and to remove all uncertainties. The time had now come to prepare the way for the new population to be gathered from every state, from Canada and from the nation's remote possessions. In re-mapping those portions of Colusa and Glenn counties included in the project, the old highways generally are retained, but other lines are ignored. The whole country is being laid out in forty-acre lots with fractional and irregular lots only along the main canal and the old highways. This shifting of lines will result in an orderly and convenient arrangement of highways which will give every future lot owner direct communication by wagon or automobile with nearby towns or settlements.

It is unusual for development companies to assume so much of the cost of improvements as the Kuhns are doing in the Sacramento valley. They are building a finished highway every half mile, so that each quarter section will have a road surrounding it and each forty acres will have a highway on two sides. A number of gravel pits are reserved from sale so that road material may be always available, free of cost, for future road repairs. The company also guarantees the delivery of water for irrigation to each forty acres, building the entire canal system so that the purchaser of a lot will have no expense for ditch construction outside the boundaries of his own land. This construction-work on the part of the company involves the carrying of water under the roads throughout the tract and the construction of a complete drainage system. Concrete construction will be used wherever permanent work requires it so that the expense of future repairs may be reduced to a minimum figure. All these improvements are included in the price of the land, and the terms on which the land is being sold, make the proposition one of the most attractive ever offered to the home-seeker in California.

The company has always had in mind the home-seeker whose means are limited. So liberal are the terms that they approach the philanthropic, yet they bespeak the confidence which the Kuhns have in their own enterprise and leave no doubt as to the early settlement of the lands. The smallest unit which a single purchaser may have is twenty acres, although ten acres each are sold to two per-

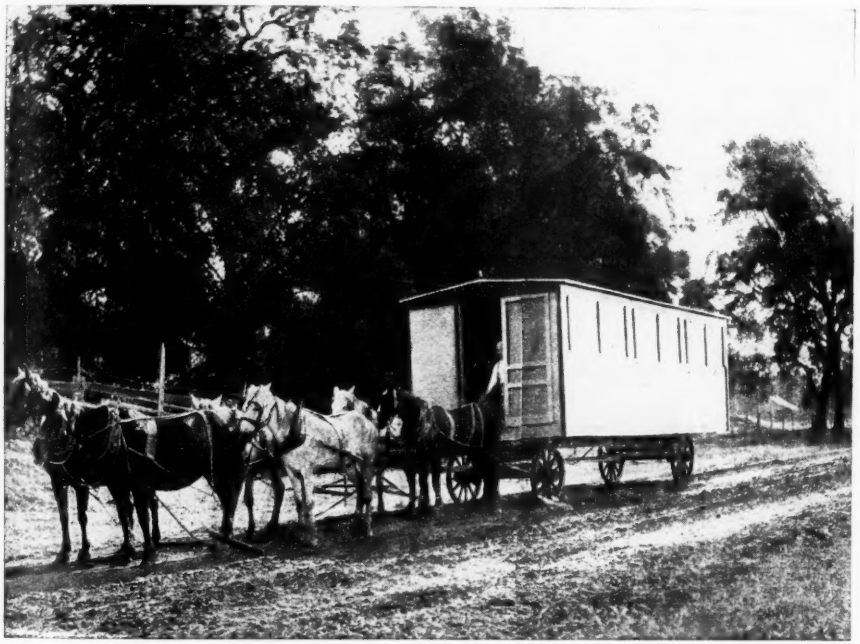
Broad acres, blest with water, provide for countless head of profitable stock

sons acting together. This is done because one or the other of the ten-acre tracts is dependent upon the other for a ditch right of way, while the right of way is provided for in all contracts for canals for each twenty acres. The largest sale to one person is eighty acres or two forty-acre lots. The sale of the lands has begun, and the first month's work showed about ten thousand acres sold or reserved for examination. This would indicate that by the spring of 1911 the entire tract will be under the ownership of settlers, actual and prospective.

The popular sized farm is forty acres. This may be bought with a down payment of $15 an acre, $600, the balance being paid in ten annual instalments beginning at the end of the second season. Interest at the rate of six per cent per annum is charged on the unpaid portion annually.

The first sales are being made in the northern part of the tract in what is termed the Jacinto Unit. The price of the land here is $125 an acre, the price including the perpetual water right and a proportionate share in the ownership of the great canal system. The contracts with the settlers require that upon the completion of the system, and after a certain number of payments have been made, the entire system shall be given into the hands of the West Side Canal Company, composed exclusively of the landowners. There will be no outside ownership of the canal system, no collecting of tribute from the community by any non-resident, non-sympathetic organization. The people will elect their own officers, will have their water at cost and reap the full benefits for themselves.

Just where the new towns of the tract shall be located has not been determined. As a beginning, the company sometime ago bought one hundred acres of land adjoining Willows, the county-seat of Glenn county, and are developing this as an addition to this old settlement. The land lies east of the Southern Pacific tracks, and is being platted and sold on attractive terms. Here the company has established its principal headquarters with Fentress Hill as general manager and D. W. Ross as chief engineer. H. L. Hollister of Chicago, who has the responsibility of selling the tract to settlers, also has a building in the Willows addition for the reception of people arriving for the purpose of inspecting the land or coming to take possession of land already bought. A competent force representing Mr. Hollister is in charge, and the welcoming of the new arrivals goes on from day to day.



These wagons are used by the Sacramento Valley Irrigation Company for its engineers in the field, either as commissary wagons or as itinerant drafting-rooms

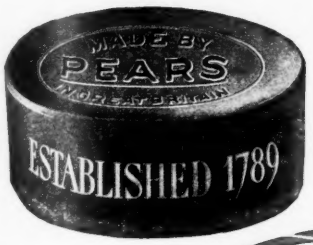
The advertising campaign which redounds to the benefit of all California is an extensive one. Recently there were issued some fifteen thousand posters, in colors, made with nine printings. These posters will be carefully placed throughout the

Oranges thrive in the Sacramento valley and come very early into the markets

country. The poster represents a tawny-haired young woman in a commanding pose calling the people to a happier and better existence in California. Another handsome product of the new art in printing is a 48-page booklet in colors, showing Californian scenes and describing the land, the climate, the soils and many other features of the Sacramento valley project. The book is being distributed generally throughout the East and advertised in the leading magazines and papers of national circulation, so that every part of the country is being reached. Lectures on California, which have a direct bearing upon the Kuhn project, are being given in Chicago and vicinity and the territory will be extended as the work goes on.

Upon one point all who inquire about California may be certain, and that is, that no careful investment ever will bring them loss. California values generally are low. California conditions generally are such as to give higher value to land than in any other state. The earning capacity of the land is large, and the climate in the great valleys and throughout the state is generally healthful and agreeable. Few people who become acquainted with California are content to live elsewhere. With the constantly improving conditions the invitation to the settler becomes stronger. The great enterprise which will establish small farm homes by the thousand in the Sacramento valley will become a potent force in development throughout the state.

A Beauty Bath for Every Home



There is nothing simpler to establish in a Home than a Beauty Bath. It is not a matter of luxurious fittings or costly appliances. Pure water and

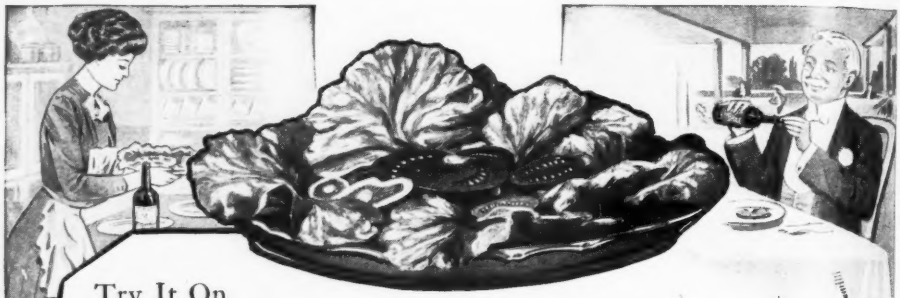
Pears' Soap

nothing more is required. With these you can accomplish all that is possible in the way of beautifying the skin. Pears softens, purifies, and sanitises the skin, making it of a natural pink and white color. More than all the cosmetics in the world, Pears is the special beautifier of the complexion.

Pears does the beautifying

OF ALL SCENTED SOAPS PEARS' OTTO OF ROSE IS THE BEST.

"*All rights secured.*"



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SALADS and obtain that piquancy so often lacking in Salad Dressings. Use

LEA & PERRINS
SAUCE

THE ORIGINAL WORCESTERSHIRE

Soups, Fish, Steaks, Chops, Roasts, and many other dishes are improved by its use. For four generations it has stood unrivaled as a seasoning.

Shun Substitutes. JOHN DUNCAN'S SONS, Agents, New York.

"Used while you sleep."

for Whooping Cough Croup, Sore Throat Coughs, Bronchitis Colds, Diphtheria Catarrh.

Vaporized Cresolene stops the paroxysms of Whooping Cough. Ever-dreaded Croup cannot exist where Cresolene is used.

It acts directly on the nose and throat, making breathing easy in the case of colds; soothes the sore throat and stops the cough.

Cresolene is a powerful germicide, acting both as a curative and preventive in contagious diseases.

It is a boon to sufferers from Asthma.

Cresolene's best recommendation is its 30 years of successful use.

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Cresolene Antiseptic Throat Tablets, for the irritated throat, of your druggist or from us, 10c in stamps.

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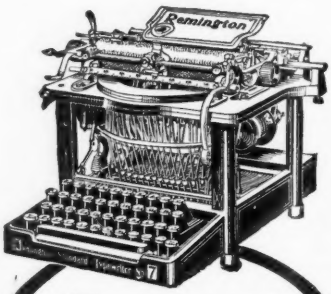

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Send a post card today, and we will mail without charge our remarkable little *Cook Book* "Y"—"What a cook ought to know about corn starch."

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Polishes the teeth to dazzling whiteness, while its fragrant antiseptic foam reaches every part of the mouth—neutralizing all tooth-destroying acids, preventing discoloration and decay.

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MASSAGE · CREAM

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After 26 years of scientific search I have perfected the one great complexion beautifier that sweeps away all other lotions, face powders and so-called creams. Different from anything you have ever used. I want you to try a little

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Only one to a person

I am sure you will be perfectly delighted with it. Clip this ad, or remember the name, and ask your druggist for a **Ten Cent Trial Package**, one-fourth the size of a regular 50 cent jar. If he can't supply you write me for it, send 10 cents, coin or stamps, and with it I'll mail you FREE my book, — **"Suggestions On Massage,"** which tells how to regain and retain a perfect complexion. Describes the anatomy, physiology and hygiene of the skin and includes my chart explaining the correct way to massage the face and neck.

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TRY CHOCOLATE TOKENS—Another unique confection enclosing the enticing goodness of Nabisco within a shell of rich, mellow chocolate.

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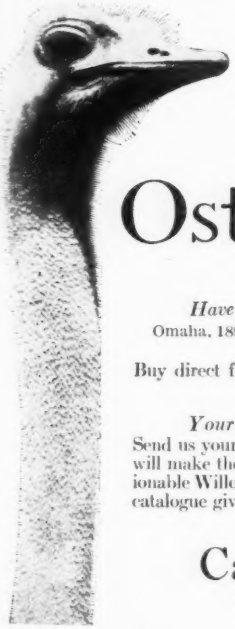

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Send us your old feathers and we will make them over into the fashionable Willow Plumes. Our free catalogue gives full particulars.

$5.00 Cawston Special

This beautiful plume, made entirely of male feathers, is 15 inches long. Although we quote length, this really means nothing, as quality and width are what count.

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Established 1886—23 years ago

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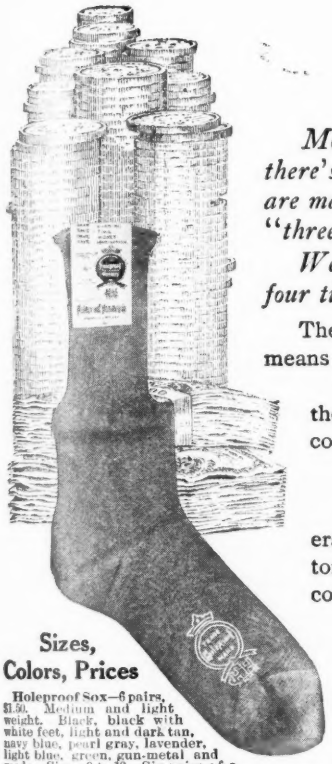

We Spend Unseen Thousands

Most hose, in the stores, look alike to you buyers, yet there's a vast difference among the different brands. Some are made with a "two-ply" yarn instead of the costlier "three." Some are knit in a hap-hazard way.

We are spending this year to produce Holeproof Hose four times what it costs to make common grades.

The fact that this difference doesn't show at a glance means that hundreds will still fail to get the best hose.

We are telling you of it so you'll know and can get them. You may as well, for these four-times-better hose cost you just the same as the others.

Where These Thousands Go

The yarn used in genuine "Holeproof" costs an average of 70 cents a pound—the top market price for cotton yarns. It is made from Egyptian and Sea Island cotton—the very finest cotton obtainable.

Sizes, Colors, Prices

Holeproof Sox—6 pairs, $3.00. Medium and light weight. Black, black with white feet, light and dark tan, navy blue, pearl gray, lavender, light blue, green, gun-metal and mode. Sizes, 9 to 12. Six pairs of a size and weight in a box. All one color or assorted, as desired.

Holeproof Sox (extra light weight)—6 pairs, $2. Mercerized. Same colors as above.

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Holeproof Full-Fashioned Sox—6 pairs, $3. Same colors and sizes as Lustre-Sox.

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Reg. U. S. Pat. Office, 1906.

Sold in Your Town

The genuine "Holeproof" is sold in your town. We'll tell you the dealers' names on request, or we'll ship direct where we have no dealer, charges prepaid, on receipt of remittance.

Write for Free Book—"How to Make Your Feet Happy."

FAMOUS

Holeproof Hosiery

FOR MEN WOMEN AND CHILDREN

It is Three-Ply

Yarn of equal weight made from but two strands is stiff and coarse in comparison. We could save, if we used it, 30 cents a pound for extra profit. This is one of the things you don't see when you buy.

Our Expensive Process

Another is our 32 years of experience; and the result—the "Holeproof" process.

We spend $33,000.00 a year simply to see that each **finished pair** of hose is perfection.

All this means but one thing—that you get in "Holeproof" the very utmost in hosiery.

Then Look for "Holeproof" on the Toe

There are hose not nearly so good as "Holeproof" sold on the original "Holeproof" idea, but the only genuine "Holeproof"—the "three-ply"—"70c-yarn" hose, bear the name "Holeproof" on the toe of each pair and the trademark shown below. "Holeproof" means four-times-better-than-common hose. It means thousands of dollars spent for comfort and wear that don't show till you wear the hose.

So be sure that the hose you get are real "Holeproof." Don't take an inferior imitation with a name and trademark resembling ours. (36)

The Holeproof Hosiery Co., 421 Fourth St., Milwaukee, Wis.

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Give Father Karo with his cakes

—and place the syrup jug where he can reach it easily. Other syrups may not agree with him, but he can eat Karo freely. It is a pure sweet that blends naturally with other foods and it is good for everybody.

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Eat it on
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*Send your name on a post card for Karo Cook Book—Fifty pages *including* thirty *perfect* recipes for home candy-making.

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Any one who can spare $2.50 or more a month can purchase an undivided interest in our 15,000 acre rubber plantation in Tropical Mexico. $25 a month paid through the development period of our plantation should bring you an average revenue of $1500 a year net profit as long as you live and leave an annuity for your heirs. If you wish to save for old age or provide for the days when you feel entitled to retire from constant work, this is a most excellent opportunity. It is more profitable than life insurance, and not so long to wait—safe as city real estate, yet not so costly; better than a savings bank for the profit is greater.

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We are changing the production of crude rubber from the primitive and destructive methods heretofore employed by the natives to the most scientific and successful plan known to modern forestry.

There is nothing speculative about crude rubber. It can be sold every day in the year in any market in the world at a price that has been steadily increasing for years. For a quarter of a century the world's supply has been spoken for, months before it reached the civilized market. The price has doubled in a decade and the question of future supply is of vast moment and can only be solved by the scientific cultivation of the rubber tree.

We are engaged in this immensely profitable industry on a large scale, having nearly one million rubber trees under cultivation which will be producing rubber in due time.

The unusual opportunity is now open to you to secure shares in our plantation. Each share represents an undivided interest in our land upon which we expect to soon have growing at least 1,500,000 rubber trees and 500,000 cocoanut trees beside other tropical products. The great work we have accomplished absolutely assures the success of our enterprise.

We have full and complete literature showing conclusive facts, logical figures and definite references of good character, proving beyond any doubt that our proposition is bona fide, certain and profitable.

It is worth your time to ask for our booklets. In justice to yourself you should provide against the ravages of time, the chances of poverty and the misfortunes of ill health, by making an investment and securing a competent income that will cover all necessary living requirements.

Write for our booklet, "A Safe and Profitable Investment," and satisfy yourself that our statements are correct. Over 900 people, after thoroughly investigating our proposition, have become associated with us in this great enterprise.

Write to-day for facts which will put you in close touch with every detail of our plan. Our literature is SENT FREE, and every request will receive immediate attention.

CONSERVATIVE RUBBER PRODUCTION CO.
611 Monadnock Building, SAN FRANCISCO

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